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A BACTERIOLOGICAL INVESTIGATION OF ASYLUM DYSENTERY OCCURRING AT MONT PARK.

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THIS paper is concerned with the preliminary results of a conjoint investigation of asylum dysentery by workers at the Mont Park Mental Hospital Laboratory and the Bacteriological Department of the University of Melbourne.

Asylum dysentery or colitis is an old and familiar scourge of mental hospitals the world over, so familiar that asylum workers are liable to become adapted to its endemic prevalence and insensitive to the amount of suffering and mortality that it causes. They are apt to regard its occurrence as something to be expected in the nature of things, a commonplace terminal event deserving no special comment.

During the year 1932 there were 24 deaths at Mont Park attributable to dysentery.

The disease attacks patients of all ages, but is particularly fatal to the old. Of the 24 above-mentioned patients who succumbed, 12 were over 60 years of age. The young and vigorous are likely to recover, the old and debilitated to die.

Post mortem the disease shows itself characteristically as an ulcerative colitis, but its manifestations are seldom confined to the large bowel. The lower end of the small intestine is almost always affected, and quite commonly the whole alimentary

canal from the stomach downwards is involved. In one very severe case even the mucosa of the œsophagus was inflamed. Often the patient dies from toxæmia and exhaustion before there is time for any ulceration to be produced. The liver is naturally damaged by absorption of toxins from the intestines and is always soft, congested and unhealthy looking. In harmony with the fact that dysentery is not a septicæmia, the spleen is never enlarged and shows little change. The chief complications in our experience have been general peritonitis and liver abscess.

In one of our cases the infection spread to the pancreas, causing an acute pancreatitis; in another, acute cholecystitis was noted. A young man who still survives developed a liver abscess, which perforated the diaphragm and produced a lung abscess which has been draining for many months through the bronchus.

The prevention of asylum dysentery is really a public health problem. In England the most effective plan has proved to be the erection of a special dystentery isolation block in each mental hospital, to which all patients developing dysentery are transferred for treatment. Once a patient enters the isolation block, he remains there for the rest of his stay in the hospital to prevent the possibility of his acting as a carrier.

As the building of an isolation block is at present impracticable at Mont Park because of the expense, it seemed worth while to consider what other steps could be taken to diminish the incidence of the disease and to facilitate its treatment.

An essential preliminary was obviously the isolation of the causative organisms and their exact identification.

Bacteriological Investigations.

Bacteriological investigations were carried out at the Melbourne University Bacteriology Department during the months of March, April and May, 1933. Specimens of fæces from twenty-two patients involved in the outbreak were forwarded from Mont Park with as little delay as possible. When these specimens were obtained within 72 hours of the onset of acute symptoms, the isolation of the causal organism was generally successful, but in the later stages it was very uncertain.

The majority of specimens of fæces showed the presence of blood and mucus. Flakes of mucus were picked out, and after being washed several times in sterile saline solution were smeared over the surface of litmus lactose agar and MacConkey plates. Although the dysentery organisms were isolated on both these media, the colonies on litmus lactose agar were larger than those on MacConkey's medium.

From representative colonies on these plates subcultures were made, and when purity was determined they were submitted to the usual preliminary tests.[1] By these means organisms considered to be of little or no importance with regard to the disease were identified and discarded, whilst those considered to be of ætiological significance were retained for further study. Of the latter there were twelve cultures in all, eight of which belonged to the *Bacillus dysenteriæ* group.[2] There was no detailed investigation of the other four cultures, two of *Bacillus typhosus*, one of a slow dulcite fermenter closely related to *Bacillus dysenteriæ* Flexner Y, and one of *Bacillus pyocyaneus;* although the last two may have played an ætiological rôle as *Bacillus pyocyaneus* was present in almost pure culture, and similar strains of slow dulcite fermenters have been described in cases of summer diarrhœa in children.[3]

It was found that the organisms of the *Bacillus dysenteriæ* group could be further classified as follows:

1. *Sonne Type.* Those giving a comparatively large blue colony with indented edges on litmus lactose agar in twenty-four hours.[4] These organisms were small, Gram-negative, non-motile bacilli with the following cultural characteristics: Slight acidity in litmus milk in seventy-two hours; gelatine not liquefied; no indol production, and positive reaction to the methyl red test. Acid was produced rapidly from glucose, mannite and rhamnose, but slowly from lactose (four to five days) and saccharose (two to three weeks); dulcite was not changed.[5] This type was isolated from two cases —Case XI (P.B., aged two years) and Case XX (J.S.). In both instances the organisms were inagglutinable immediately after isolation, but after repeated subculture agglutination and agglutinin absorption tests could be performed.[6] These tests made with serum prepared from known strains of the Sonne type of *Bacillus dysenteriæ*, together with the cultural reactions, showed that the organisms belonged to the group *Bacillus dysenteriæ* Sonne.

2. *Flexner Type.* Those giving smaller blue colonies on litmus lactose agar in twenty-four hours. These were also Gram-negative and non-motile, did not liquefy gelatine, and were methyl red positive, but possessed the following characteristics: Litmus milk became slightly alkaline and indol was produced; acid was produced from glucose and mannite; but there was no fermentation of lactose, saccharose, dulcite or rhamnose.[7]

This type of organism, which was isolated from six cases, namely, Cases III (G.C.), IV (C.G.), V (L.W.), XII (J.H.), XXI (T.Q.), and XXII (B.H.), was classified as *Bacillus dysenteriæ* (Flexner), a finding which was confirmed by preliminary agglutination tests against stock sera. As organisms which can be so classified according to cultural tests compose a group with individual differences in antigenic structure,[8] more detailed serological tests were performed with agglutinating sera prepared from V, VZ, W, WX, X, Y and Z strains of *Bacillus dysenteriæ* Flexner, and from organisms isolated from the above cases. It was first proved by cross agglutination and absorption tests that the six strains isolated were identical, and one of these,

Case V (L.W.), was taken as being representative in further typing tests. This organism was agglutinated by V, W, and X sera to 25% of the titre of these sera for their homologous organisms, by WX and Z sera to 6%, and by VZ and Y sera to 3%. Absorption tests showed that the Case V (L.W.) strain was not identical with any of the type strains used. As it appeared to be antigenically heterogeneous, it was placed in the Y group, the members of which have no predominating type components. Comparative tests with other Y strains were made, but these showed no closer relation strain to the Hiss and Russell Y strain (N.C.T.C. Number 6) which was used in the above tests, than did the Case V (L.W.) organism here described. It was therefore considered that the Case V (L.W.) bacillus and the five identical organisms isolated should be classified as *Bacillus dysenteriæ* Flexner Y.

Prophylaxis.

As the first of several possible prophylactic measures a vaccine containing 75% *Bacillus dysenteriæ* Flexner Y (L.W.) and 25% *Bacillus dysenteriæ* Sonne (P.B.), with a final concentration of 1,000 million organisms per cubic centimetre, has been prepared.[9] Three doses of 0·5, 1·0, and 1·0 cubic centimetre have been administered subcutaneously at seven-day intervals to about 160 patients in wards especially liable to infection, an equal number being left unvaccinated as controls.

As outbreaks of dysentery have occurred every year at Mont Park, it is expected that it will soon be possible to estimate the protection afforded by the use of this vaccine.

Acknowledgements.

We gratefully acknowledge help in various ways from Professor Woodruff and Mr. Gregory, of the Bacteriological Department of the University of Melbourne, from Dr. Nelson, of the Commonwealth Serum Laboratories, and from the clinicians at Mont Park, none of whom has yet become reconciled to the continued existence of asylum dysentery.

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A SUMMARY OF CHOLECYSTOGRAPHY: THE NORMAL AND PATHOLOGICAL GALL-BLADDER.[1]

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SINCE the discovery of cholecystography, the gall-bladder has undergone a veritable literary dissection from every aspect, yet it is difficult for the uninitiated to correlate the facts in gall-bladder interpretation which indicate a normal or a pathological finding.

In this summary of the study of the gall-bladder by cholecystography, I propose to take as reference the original publication by Graham, Cole, Copher and Moore, a book published in 1924 and one which still stands as a classic among the works on this subject.

History.

The history of the early attempts to demonstrate the presence of gall-stones in the human subject dates almost from the discovery of X rays themselves. Beck, of New York, is usually given the honour of being the first to demonstrate gall-stones in the living subject, but A. Buxbaum, of Karlsbad, preceded him by two years in his publication on the subject in the *Medical Press* of 1898. Out of thirty attempts he demonstrated gall stones in only four cases and after attempting to visualize under the screen a gall-stone held between the fingers, he made the significant statement that screening would never discover a calculus in the body. This statement, with rare exceptions, still holds good.

Carl Beck, in 1900, published his work on twenty-eight cases in the *New York Medical Journal*. Nine of these twenty-eight patients were found by operation to have stones, yet he was successful in demonstrating them in only two cases. He claimed that their detection depended entirely on their calcium content and that pure cholesterol stones could not be demonstrated by X rays.

It is well worth noting that in the early experimental days, the demonstration of a well calcified calculus necessitated exposures of many minutes, yet X ray burns were rarely if ever reported. No wonder that in those days the finding of gall-stones had been so infrequent that there was only one view to take of the X ray study of the gall-bladder for calculi, and that was an unfavourable one. It was in 1910 that Schurmayer studied the indirect signs of gall-bladder pathology by adhesions and their effect in the right upper quadrant of the abdomen when observed by means of the opaque meal. A year later, Pfahler, in quoting Schurmayer's work, added that when adhesions in the gall-bladder region had taken place and could be verified radiologically, there was a means of diagnosis of biliary tract disease distinctly more valuable than the direct examination for gall-stones.

[1] Read at a meeting of the Old Sydney Hospitallers' Club, Sydney Hospital, September 26, 1933.

From this date onwards, interest was rearoused and improvement in X ray machines and technique was progressing rapidly. But it was probably the work of L. G. Cole, in 1914, with serial radiography on diseases of the stomach and duodenal cap, that gave the greatest impetus to the radiographic study of the gall-bladder, for he was emphatic in regard to pericholecystitis and the significance of adhesions indicating the necessity for surgical interference. He also stated that there was a sufficiently large number of gall stones discoverable with the improved X ray technique to justify a routine search for them.

Still a few years later, in 1917, George and Leonard recorded in the *American Journal of Roentgenology* their findings with regard to the impression made by a distended, tense gall-bladder on adjacent hollow viscera during opaque meal examinations. These impressions took the form of curvilinear extraneous filling defects observed sometimes on the duodenal bulb, pyloric antrum and occasionally the colon. They also included another so-called direct sign of cholecystitis, namely the shadow of a gall-bladder on an ordinary X ray film, for they stated that the shadow of a normal gall-bladder could not be seen.

Up to the year 1924, radiography on the biliary tract had shown itself to be of very little use as a general aid to diagnosis, but it was in this year that Graham and his co-workers published the first account of their success with cholecystography and began a new era in the diagnosis of biliary tract disease.

Before proceeding to discuss cholecystography itself, a few words on the value of X ray examination of the biliary tract prior to the advent of cholecystography would not be amiss, for often one is faced with signs, or so-called signs, of cholecystitis when carrying out a barium meal or other examination.

The X ray indications of gall-bladder disease, as has already been pointed out, consist of direct and indirect signs. The surest of the direct signs is the actual finding of opaque biliary calculi, for there are no innocent gall stones. The second direct sign, namely, the demonstration of a gall-bladder image in a plain X ray film, is of far less importance, for several writers claim that it can be shown in normal subjects, except, of course, where calcification occurs in its walls for this, in itself, implies an old infection.

The indirect signs consist of fixation and displacement and, less frequently, deformity of the structures of the right upper quadrant, and are strong corroborative evidence of an antecedent inflammatory process which has involved the peritoneal coats of the structures in that locality. The other secondary sign, the behaviour of the opaque meal in relation to movement and spasm of the stomach and duodenum, indicates the presence of irritation and may occur in local and general conditions other than cholecystitis. Should a biliary fistula exist, it might become filled by the opaque meal and is, of course, certain evidence of gall-bladder disease.

With regard to calculi, various writers have differed as to the percentage of them visible by plain radiography. L. G. Cole in the past has done exhaustive work on this subject, and he concluded that 80% of gall stones submerged in bile cast a shadow less dense than this medium itself and thought that this would indicate that only 20% to 25% of stones could be demonstrated. Apart from the actual calcium content of biliary calculi, there was also the important factor of obesity of the patients, which even today greatly influences the technical result. One must not forget that by far the greater majority of biliary calculi belong to the intermediate and translucent group, and many cannot be demonstrated even under the best technical conditions.

Since the discovery of cholecystography, the other so-called indirect manifestations of gall-bladder disease, namely, impressions upon the duodenal bulb or pyloric antrum, have been shown to occur in normal individuals, and are now considered of little significance, unless they persist when attempts are made to dislocate the stomach or duodenum away from the imprinting structure. Cholecystography has also made us revise our ideas in regard to position, size and shape of the normal gall-bladder.

It will be seen from these few remarks that although biliary tract radiography was of assistance in a limited percentage of cases, yet these cases were those manifesting advanced disease and there were many more equally advanced conditions which escaped detection. There was, therefore, a great need for a means or method, not only for detection of those biliary conditions which had previously been overlooked, but also for the diagnosis of early pathological changes both of contour, position and function of the gall-bladder and its associated ducts.

Cholecystography (Graham's Test).

Graham and Cole, in 1923, conceived the idea that if the gall-bladder could be made visible by the X rays after being filled by some contrast material "not only might earlier and more certain signs of pathological change in that organ be made recognizable, but also such a procedure might be a more accurate index of function of both liver and gall-bladder".

This idea was at that time a total departure from the then recognized methods of X ray investigations such as the mechanical methods of the barium meal, barium enema and retrograde pyelography.

Abel and Rowntree, in 1909, published their work on the pharmacological investigations of some of the phthaleins and their derivatives and showed that the phenolphthaleins, as a group, were largely excreted in the bile. Fourteen years later Graham and Cole used this information as the basis for their investigations and they found that when phenolphthalein, containing either iodine or bromine in stable chemical combination with it, was injected intra-

venously into animals or man, it also was excreted in the bile and a sufficient concentration of the halogen was obtained in the gall-bladder to cast a shadow on a film when exposed to X rays.

Forty-seven substances were studied, but subsequently sodium tetra-iodo-phenolphthalein and sodium phenol-tetra-iodophthalein were shown to be the most satisfactory. They contain approximately 60% of iodine by weight, the iodine being in each instance the substance which is opaque to the X rays. It may be given by mouth or intravenously and is excreted in the bile by the liver, being diverted into the gall-bladder by the action of the sphincter of the common bile duct if the subject is fasting. In the gall-bladder, the bile and iodine become more and more concentrated, owing to the absorption of water by the wall of the viscus. It is during this period of about twenty-four hours that shadows may be obtained by radiography. The iodine is removed from the normal gall-bladder as it empties and with it goes the opacity of the organ to X rays. It is therefore evident that there is a normal cycle of filling and emptying of the gall-bladder, a process which may now be watched by radiographic observation, and it is also evident that there are certain optimum times when these observations should be made. These times have been arrived at experimentally and are fifteen, nineteen and twenty-four hours after the oral administration of dye, or four, eight and twenty-four hours after its intravenous administration. These times, however, are not strictly adhered to since individual cases vary, especially where pathological change exists.

An all-important factor in the successful examination is the abstinence from food. The taking of food, or even the smell of food being prepared, after the dye has been administered, practically nullifies the radiographic findings. This is obvious when one remembers the physiological reaction of the gall-bladder to taste and smell. Fats produce the greatest physiological effect.

The shadow of the gall-bladder alters in size, being largest at some period between the eighth and twelfth hours after the dye reaches the circulation, becoming smaller from that period onward. These changes throw light on the elasticity and flexibility of its walls. Shortly after the ingestion of a fatty meal the gall-bladder shadow decreases greatly in size. For this to take place the walls of the viscus must be free from that rigidity which would be produced by infiltration or fibrosis consequent to infection. Again, the importance of radiological investigation following the administration of a fatty meal, apart from observing the contractility of its walls, often renders calculi visible after contraction which were obscured in the dye-filled gall-bladder.

The technique necessary for success in cholecystography is of the highest order. Some people may consider that it is a simplified, ready made, universally applicable procedure, but nothing could be farther from the truth. The object should be to secure the optimum technical quality of the films for each subject. Immobility of the patient, absolute cessation of breathing, as rapid exposure as possible for technical perfection and careful development of the films, are all important factors. The position of the patient is usually the prone one with the left arm by the side and the right raised on to the pillow supporting the head, so that the nose may be occluded and the mouth shut to prevent respiration during the radiography. This standard position must often be modified to suit the type of habitus of the patient, gas in the colon obscuring the gall-bladder shadow, bizarre location of the gall-bladder and so forth.

Preparation of the patient is unnecessary before cholecystography, except to insure that gastric digestion is not proceeding a few hours before or eight hours after the intravenous injection of the dye. With the oral administration, the dye is given an hour after the evening meal of the day preceding the examination. In neither method should laxatives be employed both for physiological and pharmacological reasons and for the reason that gas may be produced in the bowel which obstructs a clear view of the gall-bladder shadow.

The dye most commonly used now is sodium tetra-iodo-phenolphthalein which is a light blue, crystalline compound having a molecular weight of 822, and soluble in water to the extent of 40%. The lethal dose of 0·27 gramme per kilogram of body weight is from five to seven times the dose employed in human beings. On theoretical grounds it would appear that obstruction of the common duct would greatly increase the toxicity of the dye, but Maddock and Whitaker (*Boston Medical Journal*, 1926) found that animals which previously had had their common ducts ligated would withstand 75% to 80% of the estimated lethal dose. Human beings with jaundice due to common duct occlusion have also been injected without any significant increase in toxic symptoms. There are also several references to the procedure being carried out in cases of subacute yellow atrophy without the production of any significant reaction.

The intravenous method of administration needs especial care to prevent phlebitis, pain and ulceration, and the method has now given place to the easier and safer method of oral administration, except in cases in which the oral method has failed on several occasions due to vomiting of the dye or its failure to reach the circulation due to other causes.

The technique of oral administration is a simple one now that "Shadocol", "Opokol" and other proprietary preparations are on the market, but, even so, some still prefer to administer the drug itself in the form of keratin-covered capsules which contain also a little powdered agar and sodium bicarbonate. The hydrochloric acid of the gastric juice forms the insoluble acid salt of the dye and so keratin is used or phenyl salicylate, either of which protects the dye from the acid gastric juice until the capsules reach the alkaline medium of the duodenum

and small intestine where dissolution and absorption take place. Four to five grammes of the dye in capsule form, or the prescribed dose of "Shadocol", *et cetera*, are given to a normal adult soon after the evening meal, which should be light and contain a minimum of protein and fat. The patient should retire to bed soon after taking the dye and totally abstain from food until an X ray picture is taken the following morning at 9 to 10 a.m. A fatty meal may then be given and further skiagrams are taken an hour afterwards to ascertain the reaction and contraction of the gall-bladder to the stimulus of the ingested fat.

The reactions to the dye are practically negligible, 60% to 70% of the patients showing no reaction at all, while others suffer from slight nausea, diarrhœa, headache or vomiting; a mild degree of "looseness of the bowels" due to the phenolphthalein is the only complaint in most cases.

For a gall-bladder shadow to occur, absorption into the circulation, excretion by the liver cells, passage down the hepatic ducts and up the cystic duct, and concentration in the gall-bladder itself must have taken place. The answer to two questions must always be ascertained, namely: "Did the patient vomit soon after taking the dye?" If so, the dye was not present to be absorbed into the circulation. And: "Has the patient disregarded instructions and taken food or even prepared food for others before coming for examination?" In the latter case the gall-bladder may have been filled with opaque bile, but at the time of examination may suggest pathological change by non-visualization or its contracted state. Assuming that the dye has been absorbed into the circulation, non-visualization and modifications will be dealt with later in discussing pathological findings.

Normal Cholecystographic Findings.

In the normal as well as pathological gall-bladder, variations occur as to its location, outline and capacity. Anatomical teaching, which is based on the average of dissecting room material, probably accounts for the erroneous general opinion that the position of the gall-bladder is constant. A perfectly normal gall-bladder may be seen radiographically lying at any point from the ninth rib posteriorly to the true pelvis and from the right abdominal wall to the mid-line, and it is also affected by posture, respiration, pressure, *et cetera*.

The determining factor in the variability of the position of the gall-bladder is the particular habitus of the individual. Consideration was first given to this by Moore in the *American Journal of Roentgenology*, in 1925, who stated that each type of habitus would exhibit a characteristic position, size and shape of the gall-bladder and that its tonus was likewise dependent on habitus. Tonus would play an important part in governing the capacity, shape and emptying time of the vesicle. Observations have confirmed this view and we now know that the relation of bodily habitus to gastro-intestinal form and function applies with equal force to the gall-bladder.

The heavy hypersthenic individual has a gall-bladder in the high position and it usually lies horizontally, producing on the film a circular or oval shadow chiefly of the fundus. At the other extreme, the asthenic will have a low-lying, long and narrow organ and its body is brought into view. Intermediate types will be intermediate in position and form from these two extreme normal types.

The size and shape of the gall-bladder are subject to an equal or almost greater degree of variation than its position and may yet be entirely normal. Its size is determined by the state of activity dependent on the digestive state, tonus, and the mutual effects of habitus and position in relation to the axis of the beam of X rays employed in making the cholecystograms. The true size of the organ can never be observed because of distortion of its shadow and the fact that an X ray photograph is in a two-plane dimension only.

The tonus of the gall-bladder conforms to habitus and to a material extent fixes its size and outline. In interpreting cholecystograms, there is a well marked tendency to ascribe pathological significance to those found in the extremes of body types, particularly in the asthenics. In this latter group are found the so-called "ptotic" and "atonic" gall-bladders.

It is widely believed and taught that "biliary stasis" is an ætiological factor in the formation of calculi and the production of cholecystitis. If we correctly understand the application of this phrase, it is restricted to the vesicle and not the ducts. There has been a great tendency to ascribe importance to the so-called "atonic" and "ptotic" gall-bladders in the production of stasis. Atonicity of the organ, when observed, must be the local manifestation of the general muscular tonus. If this is low, there is an accompanying retardation of the whole cycle of filling, concentration, and emptying of the gall-bladder, just as there is slowing of the progress of the opaque meal in the alimentary tract. If the gall-bladder shadow is clearly seen, there is no reason to suppose that its function is impaired, and one must distinguish between "atonicity" and impaired function.

"Ptosis" of the gall-bladder could never be anything but evidence of the general condition of the contents of the abdominal cavity and, if the gall-bladder shadow is of normal density, it is of no more significance than another ptotic viscus which is free from organic disease. Furthermore, it is but a manifestation of the asthenic habitus. Another point worth noting is, if biliary stasis is a feature of low position of the gall-bladder of the asthenic and is an ætiological factor in the production of cholecystitis or lithiasis, then the higher incidence of these two pathological conditions should be in the poor, thin asthenic patients. But this is not so.

Normal cholecystograms may then be summed up with the statement that there is a wide normal

variation of the gall-bladder when observed radiologically, in regard to its position, contents, outline and capacity. None of these variations constitutes, of themselves, pathological indications if the organ is well demonstrated, shows a progressive intensification of the shadow, alteration in size and disappearance of the image shortly after the administration of a fatty meal.

The Pathological Gall-Bladder.

The cholecystographic criteria of the pathological biliary tract may be summarized as follows:

1. No shadow of the gall-bladder.
2. Faint shadow.
3. Delayed appearance of the shadow.
4. Deformity of the shadow:
   (*a*) Congenital.
   (*b*) Acquired: (i) Intrinsic.
   (ii) Extrinsic, pericholecystitis.
5. Cholelithiasis.
6. Persistence of the gall-bladder shadow.
7. Excessive size of the gall-bladder.

These manifestations may be dealt with briefly under those various headings.

No Shadow.

A few words have already been said in regard to non-visualization due to non-absorption through vomiting of the dye or the ingestion of fats prior to the examination; but, provided absorption into the circulation has taken place, non-visualization is the surest and most frequent sign of pathology, but not alone in the gall-bladder itself. It is found in the physiological state of late pregnancy also. Non-visualization, when it occurs after the oral administration of dye, must be associated with clinical evidence of gall-bladder disease, and in doubtful cases the test should be repeated. There are many conditions which prevent the dye-laden bile from reaching the gall-bladder. These include diseases of the liver itself (which, of course, must be very extensive to bring about this result) obstruction of the intrahepatic duct system, the cystic and common bile ducts. An occluded cystic or hepatic duct requires no comment. In catarrhal jaundice or jaundice from any cause, non-visualization of the gall-bladder will be obvious and cholecystography will be useless and the result deceptive. This is important, for one is sometimes asked to carry out a Graham's test in a patient with manifest icterus.

Any process, local or general, which would affect the removal of fluid from the gall-bladder, for example, œdema of its walls or of the liver, would have its result in preventing concentration of the dye, hindering its excretion, or even its passage up the cystic duct. For this reason the test is contra-indicated in acute disease, either local or general. There is occasionally no shadow of the gall-bladder in association with a subacute or chronic appendicitis—a link in the pathogenesis of cholecystitis pointed out by Graham and Cole.

Fibrosis due to chronic cholecystitis and calculus occlusion of the cystic duct are the commonest causes of no shadow.

Faint Shadow.

Faint shadow is but a degree of gall-bladder deficiency of which non-visualization is the complete expression. In consequence it stands next to the latter in frequency and in pathological significance. Since it represents stages in the loss of concentrating power, it is correspondingly difficult to appraise, and it is in this group that mistakes in cholecystographic interpretation are chiefly found. The ability to gauge the density of the gall-bladder image can be gained only by observation. Here technical quality and uniformity are of the utmost importance. I wish to stress this all-important point of technique, for the relative density of the gall-bladder shadow must be estimated in comparison with the whole X ray film density. In this way variations of X ray exposure time, the penetrating quality of the X ray beam, and the obesity of the patient can be taken into consideration. The significance of this all-important point will be fully realized when one considers the technical alterations that are necessary to produce the optimum X ray films in a patient weighing eight stone and one weighing eighteen stone. The absence of this knowledge is a great disability in the interpretation of gall-bladder films in hospital practice where the shadowgraphs are taken by the technician.

A faint shadow may arise from all the causes which produce no shadow, by partial obstruction of the hepatic or cystic ducts, or impaired excretory function of the liver itself. The last mentioned can be detected only by a test of liver function.

Far more commonly it indicates a cholecystitis of lesser degree than that observed with non-visualization. With a faint shadow there is nearly always some evidence of lack of distensibility or elasticity of its wall, manifested by constancy in size or only sluggish change after a fatty meal. These findings are what one would expect with fibrosis and loss of tone and contractility of its walls. All these factors must be summed up together when the dye is administered by the oral method, for vomiting, diarrhœa, insufficient dye absorption and excretion, non-solution of the dye *et cetera* may all be a reason for a faint shadow. Faint visualization itself is significant, however, when the dye has been administered by the intravenous route.

Delayed Appearance of the Gall-Bladder Shadow.

Delayed appearance of the gall-bladder shadow can be due to any parenchymatous condition of the liver which retards the excretion of the dye, and to the possible, but unlikely, affection of the intrahepatic duct system, in the absence of true obstruction, whereby the egress of the opaque bile is retarded. Eliminating these two possibilities then, late appearance of the gall-bladder shadow indicates a slow removal of those elements of the bile which

are taken up by the concentrating function. This applies if the dye has been given intravenously, but with the oral administration the late appearance of the shadow merely signifies retardation of absorption from the alimentary canal; and provided a shadow of good density with evidence of contractility is finally obtained, it is of no pathological significance.

Deformity of the Gall-Bladder.

The congenital deformities must be differentiated from those of acquired origin, which sometimes may be very puzzling and difficult. Congenital absence, of course, is rare and cannot be diagnosed, but duplication is readily diagnosed by cholecystography, provided there is not too extensive associated disease. There are numerous variations in the anatomical course, position and relations of the neck of the gall-bladder which are sometimes observed, particularly tortuosity and apparent reduplication of the neck, but these variations are to be ignored in the face of a normal cholecystographic finding.

The Acquired Deformities.—Much work has been done in elucidating the various types of deformities found by cholecystography. If the X ray films reveal a misshapen organ, unless it is constantly present and persists when rayed in such positions as will permit the organ to move, one must be very wary in ascribing pathological significance to this finding. The same caution should be exhibited where an abnormal position of the gall-bladder is found. For example, the long mobile gall-bladder of the asthenic, when photographed with the patient in the prone position, may be folded on itself and dislocated in a most deceptive manner and appear to be fixed. Unusual shapes and the suggestion of fixation, if persistent, and especially if coupled with a certain faintness of shadow, indicate the possibility of an actual acquired deformity. This deformity may be intrinsic or extrinsic in origin.

The Intrinsic Deformities.—The intrinsic deformities are manifestations of a localized disease process in the walls of the organ which produces a permanent irregularity of outline with preservation of normal or nearly normal functional capacity (Professor Wilkie, 1925). A rare deformity is the incisura type, which is supposed to be comparable to the incisura spasm deformity frequently seen in the wall of the stomach associated with gastric ulcer. Deformities of the gall-bladder, however, are much more commonly due to adhesions than than intramural disease *per se*.

The Extrinsic Deformities.—Should the gall-bladder have been sufficiently inflamed to originate adhesions, permanent disappearance of the power of concentration usually follows; consequently the gall-bladder shadow would never be seen, unless the cholecystitis had healed with some restoration of its concentrating function. This is a possibility which may occur in many cases, leaving deformity, fixation, and severe loss of concentrating power. In a great many cases the gall-bladder shadow cannot be seen at all and the diagnosis of pericholecystitis with adhesions is almost an invariable finding at operation. It is in these cases that duodenal or other deformities may sometimes be noted during an opaque meal.

Cholelithiasis.

In relation to radiography, gall-stones are of but two kinds: the opaque and non-opaque or translucent calculi. The former contain enough inorganic material, principally calcium, to cast a shadow. The non-opaque stones are permeable to X rays and are composed almost entirely of organic material, chiefly cholesterol, and can be seen only if situated in a medium of greater or less density than themselves. As the greater majority of calculi belong to the intermediate or translucent group, radiographic technique must be of the highest standard.

After the discovery of cholecystography, contrary to the expectations of the discoverers, the finding of gall-stones proved disappointing. They hoped to be able to enhance their density, thereby making them visible, and anticipated demonstrating many gall-stones that had hitherto escaped detection. It was found, however, that where stones contained sufficient calcium for their detection by simple radiography there was almost never any concentration of dye in the gall-bladder after Graham's test was applied. Again, where stone and dye were both present, there was no more intensification of the stone shadow than one would expect from the double density of stone and dye shadows superimposed. On the other hand, a type of stone in a phase of gall-bladder disease which it was formerly impossible to discover short of opening the organ, is now frequently detected. These are the translucent stones (cholesterol) found in the gall-bladder which still has an intact absorptive function. They appear as single or multiple dark filling defects, usually circular, with rather sharply defined margins, and of varying size outlined by the dye. If no dye can enter the gall-bladder owing to associated disease or cystic duct blockage, these stones are invisible, and all one can say is that the gall-bladder has ceased to function.

When dye is present, the smaller transradiant calculi may produce the mottled cholecystogram indistinguishable from multiple papilloma. The larger dark filling defects of large transradiant stones surrounded by opaque dye have to be differentiated from overlying gas bubbles. Fortunately the gas is usually colonic, with perhaps a haustral formation, or can be displaced by rotation of the patient. Gas in the duodenum is far more difficult to differentiate, and experience in interpretation is essential.

It is stated that of all the cases in which non-opaque calculi are present at operation only 12% to 15% give certain cholecystographic evidence of their presence, yet in practically 100% there is cholecystographic evidence of an abnormal gall-bladder. It is very important to emphasize this

fact, for there is far too great a tendency to forget that after all cholecystography is a test of function, that it gives definite specific evidence of disease only incidentally, and is not a direct method solely for the detection of biliary calculi. After all, disturbed function of an organ is usually the earliest and certainly one of the most dependable signs of disease, whether that be inflammation, neoplasm, abnormal metabolism and so forth.

Opaque stones need no further mention other than because they are calcified, they can be seen by plain radiography, and cholecystography is unnecessary except where confusion with renal stones exists. There are a sufficient number of calcified stones detected by plain radiography to warrant a search before cholecystography is undertaken.

Persistence of the Gall-Bladder Shadow.

If the gall-bladder fills freely, then egress should be just as free, since, with the exception of certain fluid elements, the contents of the gall-bladder reach and leave it by the cystic duct. Therefore, if the image of the gall-bladder is observed at a later period than usual, there must be some other explanation than a pathological one. This phenomenon may be observed if the dye is reabsorbed from the alimentary canal, if there is abstinence from food after the first X rays are taken, or if a meal containing insufficient fat to produce the normal contraction of the gall-bladder is given after the initial examination.

Excessive Size of the Gall-Bladder Shadow.

Images may vary 200% to 300% and yet be normal. If a gall-bladder is well visualized, size is *per se* of no diagnostic importance, since the most common cause of enlargement is due to obstruction of the common or cystic ducts, and under these conditions no shadow of the gall-bladder could be obtained.

Diagnostic Efficiency.

Now what is the diagnostic efficiency of cholecystography? In the pathological biliary tract cholecystography supplies directly but little information, save as to the condition of the gall-bladder itself. However, a normal X ray finding presupposes normal function and eliminates the biliary tract as the offender in a case for differential diagnosis.

In tumours of the gall-bladder cholecystography has done little to aid in diagnosis. Over-concentration of the bile is supposed to accompany papillomatous disease. If an excess of fluid is removed from the opaque bile, it is removed by the increased absorbing surface, due to the papillomatous disease of the mucous membrane. This condition is exceedingly rare. Carcinoma involving the gall-bladder and ducts does not permit visualization of the vesicle, and as carcinoma so frequently follows on chronic irritation or inflammation, or itself produces irritation and inflammation, the reason for no shadow being obtained is obvious.

Excessive rugosity of the lining mucosa of the gall-bladder, especially in its contracted or partly contracted state after a fatty meal has been given, may simulate a mottling due to minute calculi. Many small calculi are only demonstrated in this manner which were obscured in the dye-filled organ.

Cholecystography applied in post-operative cases rarely gives any information, as a shadow of the gall-bladder was obtained after cholecystostomy in only one case out of a series of twenty-five recently examined (Edinburgh). When a persistent external biliary fistula is present, the only method of examination is by the injection of lipiodol into the sinus itself, together with a few mouthfuls of barium meal to outline the stomach and duodenum at the same time.

Gall-stones and cholecystitis rarely occur in children, yet I have seen two cases of gall-stones in young girls, one a thin patient of sixteen years and the other a fat patient aged twenty-one. Cases have also been reported in the literature of the discovery of gall-stones in children. Cholecystitis must in very many instances have its origin in adolescence or early adult life and has been called a disease of this period with middle age manifestations.

Cholecystography is the only method for the detection of early signs of changes in function (with emphasis on the "function"), for many still consider it only a method for the demonstration of calculi that would otherwise remain invisible. Early functional changes can be detected, and it is an easy method of examination in young adults who have had obscure appendiceal symptoms, transitory jaundice or any generalized infection which has left vague abdominal or digestive symptoms. These, as we know, are often the early complaints in the history of a definite chronic cholecystitis of later life.

Differential diagnosis is necessary in connexion with those conditions in which other X ray procedures are required, that is, conditions of the gastro-intestinal tract and right urinary tract. The investigation is exceedingly helpful when a deformity of the duodenal bulb is present in regard to the origin of which a doubt exists. Cholecystitis and duodenal ulcer may both occur, and frequently do, but the test is very helpful in demonstrating the presence or absence of adhesions. Again, duodenal ileus and chronic cholecystitis symptomatically resemble one another, and the gall-bladder may be shown to be normal by cholecystography, yet it is well known that the latter may subsequently follow duodenal ileus.

There is frequently great difficulty in diagnosis between kidney and gall-bladder disease in the right upper quadrant of the abdomen, especially when an opaque body is shown on a film which does not conform to the differential points between gall-stones and renal calculi. Even pyelography will not always determine the nature of such a finding, and it is in these cases that cholecystography is of inestimable value. Renal and biliary calculi may

coexist, and there also may be chronic cholecystitis and pyelitis, in which case both examinations will be necessary.

There have been quite a number of cases of supposed *angina pectoris* which have revealed a pathological gall-bladder and absolute relief of symptoms after cholecystectomy. Again, in those pathological conditions which may be ascribed to a hidden focus of infection, cholecystography will often reveal a diseased gall-bladder which is symptomless. Spinal disease and chronic cholecystitis often have symptoms which are similar, and one frequently sees evidence of spondylitis in films taken during the X ray examination of both normal and pathological gall-bladders.

Finally, to recapitulate briefly the main points of importance in cholecystographic interpretation. If the gall-bladder fills, concentrates, alters in size and empties properly, it is functioning normally. The capacity to estimate normal concentration is gained by experience and due regard to technical quality of the films. This latter is the most important factor in the observation of early alterations in the gall-bladder function.

If no shadow of the gall-bladder is obtained (due consideration having been given to the extra cystic factors mentioned previously) then the function has been definitely lost and the gall-bladder is pathological.

In the finding of non-opaque cholesterol stones one must beware of intestinal gas and repeat the test if there is any doubt, for a gall-bladder containing these translucent stones frequently has a good concentrating function.

Faint cholecystograms indicate a loss of power of concentration and represent impairment of function somewhat proportional to its involvement. These are the cases where correlation of facts and judgement are required.

If fixation and persistent deformity of outline occur with faintness of the shadow, they are reliable pathological signs.

Constancy of size of the gall-bladder shadow is of slight importance unless coupled with lack of density and adequate fatty intake after the first cholecystograms are taken. In that event, it is an important pathological finding.

If the liver function approximates normal, retarded appearance of the gall-bladder shadow is a valuable but rare sign.

Cholecystography is an extremely accurate measure of the functional capacity of the gall-bladder. This functional capacity is decreased in proportion to the intensity and duration of the disease process which may have involved it.

And lastly, a gall-bladder which shows marked cholecystographic changes need not, and in fact more often does not, exhibit classical clinical symptoms of disease. The aim is to observe and demonstrate the early signs of pathological changes in the gall-bladder, just as it is in carcinoma of the stomach, for if we wait until classical signs appear irreparable damage has already been done.

MONOCYTIC LEUCHÆMIA.

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JUST as there is a myelocytic leuchæmia involving the marrow cells and a lymphocytic leuchæmia involving the lymphoid cells, so there is held to be a monocytic leuchæmia involving the third type of white blood corpuscle and its formative tissue. The matter has had much attention in recent years, but mostly in connexion with the very vexed question of the origin and relationships of the monocyte. The contrariety of views leaves still much unsettled, but there has emerged a viewpoint which has permitted recognition of some twenty-two cases regarded as monocytic leuchæmia, and such a case has been observed recently in this hospital. Attention is here called to the subject, as it seems possible that forms of leuchæmia difficult to classify are of this type, which should be more frequent than reports indicate. The following account is composed from available records and comparison with the instance we have had the opportunity of studying for ourselves.

As in other leuchæmias the cases are more frequent in males (five males to one female) and have had no special age incidence (evenly distributed between five and seventy years). Our case was in a male, aged twelve years.

There are no definite predisposing conditions, but typhoid, influenza, pyelitis, otitis, arthritis and fever are mentioned as having undermined the general health in different cases. Our boy had pneumonia some time ago, a "cold" for the past three months, and whilst in hospital a temperature ranging between 37·2° and 37·8° C. (99° and 100° F.).

The onset is fairly sudden, or at least there is rapid progress after the first definite signs. The only conspicuously frequent initial symptom is some buccal inflammation—gingivitis, stomatitis, angina, bleeding gums *et cetera*. There follow increasing pallor, weakness, abdominal protuberance and discomfort and pain. Examination reveals enlargement of the spleen, or of the liver, or of both; but the lymph nodes are less involved, sometimes being noted as "palpable" only. In our case there was marked pallor, splenomegaly, hepatomegaly, with abdominal pain and vomiting; some slight swelling of the submaxillary lymph glands, the others being normal; weakness and marked breathlessness on even slight exertion.

Anæmia is recorded in practically every case; often the initial diagnosis is anæmia of some kind. Usually the anæmia is of the order of 2,000,000 to 3,000,000 red cells per cubic millimetre, but with a range from 4,000,000 down to 1,000,000—exceptionally lower, 800,000 and 750,000, in two of the reports. In our case three counts at intervals of ten days and three days respectively gave 1,610,000, 1,570,000 and 930,000 per cubic millimetre, the last, on the day before death, showing rapid terminal

failure of erythropoiesis. The hæmoglobin content is not unduly low, so that the colour index is usually on the high side (0·8 to 1·0 in our case). The marrow is not aplastic. In our case there were small numbers of normoblasts, reticulocytes, and polychromasic reds.

The white cell counts have varied widely. They are commonly high (up to 475,000 per cubic millimetre), but usually lower and frequently enough not above 20,000—occasionally 10,000, and in two cases under 5,000 per cubic millimetre. In our case the numbers were 10,000, 4,900 and 1,000 per cubic millimetre, again revealing the failure of hæmopoiesis. The numerical variations in this form are thus comparable to those of the other leuchæmias.

The distinguishing feature is in the differential count, which shows increased proportion of monocytes. This is given as ranging from 50% to 90% of the total white cells, but sometimes is 40%, 30%, and even 20%, the normal maximum being regarded as about 12%. Necessarily the proportions of other cells are low. As a rule neutrophile cells are absolutely low, as also are blood platelets: further evidence of marrow restriction. In our case the neutrophile cells were 19%, 14% and 16% (1,900, 686 and 192 per cubic millimetre) in the respective counts, and the blood platelets were 100,000 twice. Eosinophile cells were 1% in the first and none in the other two counts.

Obviously the differential count between lymphocytes and monocytes must depend on the observer's conception of the monocyte and upon the rigidity with which he applies his criteria. It may be, as claimed, that more than the one type of cell comes under the heading monocyte in routine blood work; and it must be conceded that some cells are difficult to classify. Hence the differentiations must be liberally regarded at the present time. For our purposes the monocyte was taken to be a large mononuclear cell with a lobed and folded nucleus and grey blue cytoplasm showing fine dark red granules with the usual blood stains. We had no opportunity of applying supravital or oxidase reactions during the brief two days the boy was in hospital. Whilst the points mentioned were quite definite in most of the cells classified as monocytes, there were some in which the folding or the granules were not so clear, but which nevertheless were not lymphocytes. These were regarded as younger or immature forms and so part of the leuchæmic process; and there were occasional forms with short processes or pseudopodia of histiocytic character.

The cells so indicated were present in our patient's blood in the proportion of about 42%, slightly different in different counts. Lymphocytes also averaged 42% and neutrophile cells 16%. It is evident that there was a decided monocytosis, some increase in lymphocytes, and marked diminution of marrow cells. Notwithstanding this last feature, there appeared a fair number of myelocytes (20%) in the final count—a not uncommon event in the terminal stage of leuchæmias.

The total duration of monocytic leuchæmia is short, ranging from three or four weeks to eight or ten months, mostly two or three months. Our own case lasted nearly four months from the given date of onset, but was not seen by us till the late stage. The child succumbed to progressive asthenia.

Autopsy records reveal hyperplasia of the liver, spleen, and lymph glands due to monocytic infiltrations, these latter being present also in organs not visibly enlarged. Our case was strictly conformable in these respects, as will be seen by reference to the pathological details given in the appendix to this paper. Here it will suffice to state that the liver, spleen and kidneys were grossly enlarged, though the lymph nodes were not above normal size. All these organs, as well as the heart, lungs, pancreas, thymus and bone marrow—in short, every tissue examined—were richly filled with cells of the type above defined as monocytes. These cells occupied the connective and reticular tissue of the organs and spared wholly or in part the proper parenchyma. In the heart they were sub-epicardial, in the lungs peribronchial and perivascular, in the liver mainly portal, in the kidneys intertubular, and so on, but the lymphoid organs, spleen, lymph nodes, thymus, were more disturbed in their proper structure, which was largely replaced by the monocytic cells. Hæmorrhages were present in the lungs, heart, spleen, and very abundantly in the kidneys. Thus the expectations of a monocytic leuchæmia are fulfilled by the data from our case; there was an excess of monocytes in the blood, accompanied by their immature forms, and a general hyperplasia of the reticulo-endothelial cells from which, according to current views, the monocytes are derived.

Monocytic leuchæmia is not greatly different clinically from the other forms. As in them disturbance of form and function are due to overburdening of the tissues by abundantly multiplying cells and by the pressure extinction of hæmopoiesis and consequent malnutrition. The essential difference is in the kind of cells involved and the arraignment of the monocyte simply brings it into line with the other forms of white corpuscles already incriminated in the leuchoses.

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I am indebted to Dr. C. L. S. Macintosh for permission to publish this case, which was under his care in the hospital.

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Appendix.

Pathological Details of Case.

Body of boy was pale but well nourished; the abdomen was prominent.

Lungs.—The lungs were congested, œdematous and hæmorrhagic in patches. Slight fluid was present in the pleural sac. Microscopically, monocytic accumulations were present, round bronchi and vessels and irregularly elsewhere. Some shedding of alveolar cells was noted. There was no pneumonia.

Heart.—Slight excess of pericardial fluid was present. Small hæmorrhages were seen under the pericardium. Here also there were accumulations of monocytic cells, mainly in vascular adventitia. The intramuscular trabeculæ were not generally involved, but showed an occasional cellular patch. The cardiac fibres were normal.

Liver.—The liver was enormously enlarged, smooth, firm, and of a pale yellow colour. The gall-bladder and ducts were normal. Accumulations of monocytes were present in the portal areas and in large and small groups in dilated sinuses. Kupffer cells were not conspicuously altered.

Spleen.—The spleen was very large, soft, dark red, with deeper mottling. Its capsule and trabeculæ were normal; the reticulum was distinct but not excessive. No nodules were seen. The Malpighian bodies were obscured and, when found, were irregular. The sinuses were crowded with monocytes.

Pancreas.—The pancreas appeared normal, but microscopically showed abundant monocytic accumulations, especially in the subcapsular and trabecular tissue, with some penetration of lobules. Acinar cells and ducts were normal. The islets were difficult to discern.

Mesenteric Lymph Node.—A mesenteric lymph node showed massive occupation by monocytes which quite obscured its structure. Periglandular fat and areolar tissue were also richly studded by these cells. Only scattered lymphocytes were seen.

Kidneys.—The kidneys were both greatly enlarged, but the shape was retained. The capsule and substance were abundantly mottled with hæmorrhages. Everywhere between tubules innumerable monocytes were present, but glomeruli and the renal epithelium showed little change. Perirenal areolar tissue and fat were also richly monocytic.

Thymus.—The thymus gland and its areolar tissue showed abundant monocytes. Hassalls's bodies were few, but unusually large.

Bone Marrow.—The bone marrow was very rich in monocytes. There were also many myelocytes, apparently all neutrophile, but very few leucocytes. The erythron is diminished, not only in the tibial marrow, but also in the rib, where it should persist. There were not many erythrocytes, and erythroblasts were difficult to find.

THE EARLY DIAGNOSIS OF CANCER OF THE CERVIX UTERI.

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IN spite of the extensive campaign against and research into the causation and cure of cancer, every surgeon still encounters numerous cases of cancer of the *cervix uteri*, which, when first seen, have advanced to the border line or hopeless stage. When we see these cases we are only deceiving ourselves if we hold out any great hope of cure. Certainly radium produces excellent results in some cases, and surgery followed by radiation of the pelvis likewise gives a percentage of cures, but still far too small a one.

Radiation is still an uncertain quantity to those experienced in its use. Surgical technique has not advanced since Wertheim described his operation, and the modern trend in the more advanced cases is to abandon surgery for radiation alone.

The ultimate mortality rates of the two methods have little between them, but the operation is severe and, even in the hands of experienced surgeons, has a very high primary mortality rate. Considering this, the ultimate survival in time from the first treatment is probably in favour of radiation. Today, as in the past, I still feel that the greatest prospect of cure lies in early diagnosis.

One well-known Sydney surgeon once advocated the performance of a total hysterectomy in all cases where hysterectomy was necessary, saying that the cervix, if left, was liable to develop carcinoma and was consequently a danger. This, I think, is carrying prophylaxis too far, for the *cervix uteri* definitely has both an anatomical and physiological use, but it shows how hopeless this surgeon must have felt toward the problem.

Cancer at first is definitely a localized disease. This is shown by the work of Schiller[1]. In the early stage when hope is greatest, the carcinoma shows no definite or only very slight visual signs of its presence and has no subjective symptoms. Schiller, faced with this problem, decided to search for the earliest manifestation of cancer of the *cervix uteri*, and to this end submitted the cervix of every uterus removed at the Frauenklinik, of the University of Vienna, to an extensive microscopical examination. The youngest part of an established carcinoma is at the edge, and to this he particularly turned his attention. In most cases of the advanced carcinoma he noticed that the growth was separated from the healthy epithelium by a small inflammatory zone free from epithelium, but in a small percentage of cases the carcinoma was in direct junction with the normal epithelium, and forms what he calls a "superficial carcinomatous layer" surrounding the growth of about the same depth as the normal epithelium, but definitely marked off from it. The cells in this layer are marked off from the connective tissue and show no tendency to penetrate. In his systematic examination of his material, Schiller found cases in which a superficial carcinomatous layer covered areas up to even half the cervix, some with an intact surface and no downgrowths and others with relatively small ulcerations and downgrowths. These are the youngest types of carcinoma. In the early type, then, there is no downgrowth or metastasis. Downgrowth is bound to develop, sometimes early, but sometimes it may not appear for months or years. The demarcation between the carcinomatous layer and the normal epithelium is always distinct, so that it is possible to indicate the exact point to which the carcinoma reaches. Areas of transition are not to be found and the line of

demarcation is always oblique, the basal part of the growth extending further laterally than the surface. Schaffer has pointed out that squamous epithelium undergoing differentation may become cornified or gather glycogen. In the epithelium of the cervix this latter property is characteristic. This glycogen differs from that obtained from the liver in that it is not soluble in water and stains in sections even after washing for hours. This glycogen disappears when the epithelium becomes carcinomatous, and thus is not present in the carcinomatous layer.

This gives us a method of making a very simple test to locate these early carcinomatous areas, for glycogen is stained mahogany brown by iodine (Lugol's solution), so cells containing glycogen, that is normal cervical epithelium, stain deep brown, whilst areas not containing it, for example, the carcinomatous layer cells, are not and stand out white in contrast. This test, for which credit is due to Schiller,[2] places at our disposal a very rapid and easy means of diagnosing, or at least suspecting, the presence of a condition otherwise difficult to detect. This test is for the presence of glycogen in the surface epithelium and the presence of unstained epithelial spots may be due to four conditions: (i) Presence of carcinomatous layer or early carcinoma. (ii) Presence of hyperkeratosis, a result of prolapse and exposure. (iii) A healed luetic infection. (iv) Desquamation of the upper glycogen-containing layers of the epithelium due to trauma from instruments used in examination. Such traumatic desquamations can easily be recognized by their form.

This method is of value in locating the new-growth as long as it is in the stage of a carcinomatous layer. When ulceration occurs, the surface being composed of necrotic tissue, stains brown, and unless the carcinomatous layer round the edge is marked, the method is not helpful; but against this, an ulcerated carcinoma is generally sufficiently large to be diagnosed, or at least suspected, at sight. A simple erosion is only slightly stained by the iodine, but it cannot be mistaken for the white carcinomatous layer. When any suspicious area is discovered, a portion of it containing the edge of the white area should be removed and examined microscopically.

Summary.

A method is here described which facilitates the early diagnosis of cancer of the *cervix uteri*.

It is so simple and the results of treatment in the later stages of this disease are so unsatisfactory, that I suggest and hope that the test will be applied by every medical practitioner when he has reason to examine any woman over thirty years of age.

Any suspicious areas should be examined microscopically and if the diagnosis is confirmed, the patient immediately submitted to treatment.

I feel certain that if this test is generally adopted, there should be a marked improvement in our cancer statistics through the patients coming earlier to treatment and thus receiving it whilst the disease is still localized and hope of cure greatest.

Acknowledgement.

I have to thank Dr. Walter Schiller, of Vienna, for sending me copies of his original papers on which this paper is based.

References.

(1) Walter Schiller: *"Zur histologischen Frundiagnose des Portiokarzinoms"*, *Zentralblatt für Gynäkologie*, 1928, Number 25, page 1562.

(2) Walter Schiller: *"Zur klinischen Frundiagnose des Portiokarzinoms"*, *Zentralblatt für Gynäkologie*, 1928, Number 30, page 1886.

A NOTE ON THE THERAPY OF ALLERGIC MANIFESTATIONS IN THE NASAL CAVITIES.

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So much has been written of recent years concerning the various allergic manifestations that we see in all branches of medical practice, that I hope any interest you may have in tonight's proceedings will not vanish immediately on learning the title of this paper. Let me relieve your anxiety: I shall be brief.

I chose this subject largely because I felt that my own thoughts on it needed crystallization; that I could work better if I had some considered plan to deal with this distressing affection according to the severity of the symptoms, their time and mode of onset. You will rightly gather from this remark that I intend to deal more with the therapy than with the ætiology or pathology of allergy as it affects the nasal passages; but in order to do this rationally I think there must be some mention of what we know (or think we know) about its mechanism.

Ætiology.

The number of "cures" is legion. Each nasal surgeon has his pet method by means of which he registers a moderate percentage of good results; but, in the multiplicity of "cures" lies the tacit admission that we fail in our knowledge of essentials. Let us consider for a moment a few of the ideas that have been advanced to account for this state of nasal allergy (if you will permit the jargon). I say "a few" because I feel that to deal effectively with the deluge of theory that has descended on us during the past few years is a task beyond me.

General causes are as follow: Sensitiveness to exogenous proteins, sensitiveness to endogenous proteins, endocrine deficiency, calcium deficiency, unsuitable diet with deficiency of acid ash or alkaline ash forming foods, faulty carbohydrate metabolism, vasomotor dysfunction.

Local causes include: Undue sensitiveness of nasal mucosa generally, occurrence of trigger areas, septal deflections, affection of spheno-palatine ganglion, sinus infections.

Treatment.

Now in dealing with the patients who come to us with complaints of sneezing, nasal blocking *et cetera*, what is to be our method of procedure? The solution of such a problem is apt, in these days, to involve us in a therapeutic maze unless we retain a sense of proportion. For the treatment of this distressing malady we have at our disposal the following means. Doubtless there are many others with which I am unacquainted.

General treatment includes: (i) Administration of thyreoid gland extract, (ii) administration of calcium in some form or other, (iii) administration of mineral acid, (iv) attempting to alter the patient's body chemistry by dieting, (v) desensitization—specific, (vi) non-specific protein therapy, (vii) autoserotherapy, (viii) following the trail of the urinary proteose, (ix) giving injections of sodium iodide in 5% solution, (x) administration of ephedrine.

Local treatment may be described under the following headings: (i) Removal of intranasal pressure, (ii) destruction of sensitive areas (trigger zones) by galvano-cautery or chemical caustic, (iii) washing out or draining antra, (iv) repeated painting of interior of nose with (*a*) carbolic acid, (*b*) trichloracetic acid, (v) zinc ionization to the nasal cavities, (vi) injection of the nasal ganglion, (vii) injection of the turbinate mucosa with various chemical agents, (viii) exposure to ultra-violet rays, (ix) exposure to X rays, (x) painting the nasal vestibule with nitrate of silver, (xi) a "nasal douche" of carbon dioxide gas; (x) the local use of various sprays and ointments. Apart from these, there is the obvious method of avoiding localities, objects or substances which are known to produce attacks.

Now this is a fairly formidable therapeutic battery, which proves to me more conclusively than anything else, that the selection of the most hopeful form of treatment in each individual case should be our aim; and we should avoid being carried away by a few successes achieved by one particular method, by the probability that the next case treated in the same manner will be a complete failure. The man who says: "I do thus and thus to my patients, and they all get well", is simply imposing a test on our credulity, as well as deluding himself.

There is no infallible remedy for the cure of these patients; so let us make the best use we can of the means at our disposal, hoping that experience will teach us more and more certainly the short cut to relief for each individual, and realizing that we have a very long way to go before we can speak confidently of "curing hay fever" in all cases.

First, I think that we should classify the condition of our patients under two headings—seasonal or non-seasonal. In my experience the more definitely seasonal the type the better the chance of giving satisfactory relief, and the less the likelihood of any gross morbid change developing in the nose or sinuses. In this type the destruction of sensitive areas by cautery or caustic, or removal of pressure by septal resection may be expected to give good results in mild cases. In any case there can be no doubt that such measures are useful adjuvants, lessen the severity of symptoms, and furnish an aid to other forms of therapy, should such become necessary. If this fails or if symptoms return after a time, the tests for sensitiveness should be carried out, and an attempt (generally satisfactory) should be made to desensitize patients.

Speaking broadly, I think that desensitization is our sheet-anchor in the treatment of hay fever, but the tests must be carried out by someone who has made a real study of this subject. Dabbling in stock preparations by the unskilled in an attempt to elucidate an intricate problem in allergy is apt to be a sterile process diagnostically and therapeutically. I think it is almost universally accepted that we have to deal with an underlying fundamental allergic tendency, *plus* a trigger action (for want of a better term). The trigger action may be dealt with locally (and more or less successfully) by a variety of means, according to the intensity of the disease. In addition to those means already enumerated, desensitization offers the greatest assistance; but with the perpetuation of the basic allergic tendency it insures no permanency of cure, as it is always possible for the subject to become sensitive to some fresh protein.

Then comes the question as to how to classify the patient who gives no reaction when tested with the greatest thoroughness for sensitiveness to foreign protein. Is he to be grouped with those patients whose sensitiveness can be proved? In my opinion he is—at least for practical purposes—I should not care to commit myself further than this. Admittedly one valuable avenue of treatment (desensitization) is closed to us; but others remain open, and much may be done to help.

Recent American literature stresses the successful use of the free application of carbolic acid or trichloracetic acid to the nasal mucosa; such treatment to be repeated indefinitely, every month if necessary! This is surely the most outrageous therapeutic insult that could be offered to the long-suffering nose; but it shows to what lengths the adherents of local therapy will go in pursuit of their hobby.

The fallacy of relying solely on local treatment for patients suffering from nasal symptoms of allergy will be apparent when we consider the accompanying itching of the ears, palate and eyes. If the treatment to the nasal mucosa always entails destruction of sensitive parts, surely the ophthalmic surgeon would be justified in applying the cautery to the eye, *et cetera*. Up to date I have not come across anyone who has the temerity to suggest this, and for this reason I feel that (speaking broadly) only the mildest of allergic manifestations in the nasal cavities are likely to be successfully abolished by nasal cauterization. Admittedly we have the occasional dramatic cure of severe symptoms by these means, but that is what hay fever is like—

full of surprises, not of certainties. Again, the sponsors of this treatment should remember that not all patients having nasal irritation and sneezing are necessarily allergic patients; at least the fact cannot be demonstrated in all cases. These would seem to have merely an irritable nasal mucosa, or possibly to suffer from a vasomotor neurosis, and would provide suitable material for treatment by cauterization. This type of patient rarely shows any morbid change in the nasal mucosa or sinuses. During an attack the tissues may be pale, swollen and watery, or red and irritable; but at other times there may be nothing to distinguish the nose from that of a normal person.

Should it be impossible to relieve these patients by the above-mentioned methods, trial should be made of the effects of the regular administration of mineral acid. I have come across a number of patients (curiously enough, of the seasonal type) who find that a few doses of nitro-muriatic acid will suffice to free them from trouble. Zinc ionization to the nasal cavities, though rather a distressing performance in the presence of a hypersensitive mucous membrane, sometimes gives good results, and has the virtue of prolonged effect. A propos of this I should mention that two of my patients appeared to be sensitive to zinc, as its application in this manner intensified the symptoms, and the use of zinc drops in the eyes of one at a later date produced an attack of eczema of the lids.

In the case of a woman it may be necessary to forbid any cutting or arranging of flowers, even though no offending pollen has been identified.

In dealing with cases of the non-seasonal type, I find that much greater difficulty exists, and in them one can usually notice the effects on the nasal mucosa of prolonged œdema. It appears to be more difficult to identify an offending protein by the sensitization tests, and the reactions given are often classed as "weak", unless the subject be sensitive to one of the various epidermal proteins or to house dust. The patient is seldom free from trouble, and in the worst cases the turbinate and septal mucosa is swollen and bluish, and the nose continually blocked.

It is only logical to expect changes in the sinus mucosa of these patients, and indeed they rarely fail to show it. These are the patients of whom we must beware lest we embark on unnecessary and sometimes harmful surgical interference. One criterion of the advisability of operation which has been supported widely in the literature takes into consideration the eosinophile count of the blood.

It has been said that patients with an eosinophilia of 5% or over should not be operated upon. I have been to some trouble to prove the fallacy of this statement. Most of these patients show a rise in the eosinophile count, and in the case of asthmatics it is an accepted feature of the picture. In some of my most successful cases amongst asthmatics there has been an eosinophile count of 10% or more, and I am convinced that this abnormal blood picture does not, *per se*, furnish a contra-indication for operation. It has been said also that patients who are unable to tolerate aspirin should not be operated upon. I have not investigated this, so should prefer not to comment on it further than to say that it seems an extraordinary test on which to base the estimate of a patient's probable reaction to surgical trauma. We have to provide a satisfactory answer, if possible, to three questions in these cases of nasal polyposis:

1. Is the process purely allergic?

2. Is there an infection grafted on to an originally allergic base?

3. Is an infection present without any suspicion of allergy?

Group 3 patients will require operation. We are not further concerned with them.

Group 2 patients will require operation, but will almost certainly require some additional treatment, and it has been my custom to adhere to the following routine with them if nasal blocking and discharge persist after operation. First, attempt to desensitize the patient. Should this fail, try zinc ionization, and if the symptoms still persist, I have, during the past twelve months, handed the patient over to the radiologist for X ray therapy, in the hope that a fibrosis may be produced. I have been surprised at the relief which is occasionally produced by the use of X rays, and I intend to give this method of treatment a more extensive trial.

Patients in Group 1 should not be operated upon as a routine. They present our most difficult problem and provide our most disappointing surgical results, so that I have learned to resist the temptation to operate, except in the case of extreme polyposis. In this group the surgeon should not be unduly influenced by X ray appearances, as pictures taken at a time when the nasal passages are blocked will almost always show thickening of the sinus mucosa, even to an extent amounting to a polyposis. I think that this type of patient should be desensitized, or that the use of X rays should be tried before recourse to surgery. These are the patients (of whom we have all seen examples) who frequently are made worse rather than better by operation. Should the septum be resected, the results are often deplorable, as the nasal blocking becomes greatly accentuated by the swollen flaps, and the patient's last state is worse than his first.

In the lists given in the earlier part of this paper, mention was made of various therapeutic measures which I have not so far spoken of again. Some appear to me to be so fantastic that I have not put them to the test; but one or two I think should be mentioned.

So much has been written about the sphenopalatine ganglion and the results that may arise from its irritation that I confess I immediately "shy off" when I read of it in connexion with any fresh cures. To dispose so cavalierly of a possibility may be extremely unscientific, but so many startling

theories regarding the possible activities of this ganglion have appeared in the medical literature of the last few years, that I feel that one may be pardoned for exhibiting a little scepticism. Admittedly the ganglion is probably a parasympathetic cell station, stimulation of which might cause a nasal vasodilatation, but I do not think that the routine cure of hay fever is to be found here. Intramuscular injections of sodium iodide have been well spoken of by reliable observers, though it is admitted that the treatment is empirical. I have used it a few times with success, but have not a sufficiently lengthy experience of its action to be able to assess its permanence or otherwise. I have never employed non-specific protein therapy, nor have I made use of ultra-violet rays, though I can conceive that each of these might have a place in the treatment of nasal symptoms in allergy.

The pronounced hereditary tendency in allergy, I think, effectively disposes of the theory that dietary deficiencies or irregularities can amount to more than an exciting influence in the production of nasal allergic symptoms. Children less than three days old have proved sensitive on testing. What each and every one of these patients does exhibit is an increased capillary permeability, as evidenced by the occurrence of hay fever, urticaria, purpura, angioneurotic œdema and (probably) vertiginous attacks. This seems to me to be the one fact that we can grasp, and I feel that if we could satisfactorily answer the question, how (if at all) we can control this increased capillary permeability, we should have solved our therapeutic problem.

In conclusion I ask you to remember that I speak purely as a clinical observer, and as such I know that I lay myself open in discussing such a complicated subject, to the derisive comments of the laboratory worker and biochemist. May I wish them success in their investigations, for in their hands lies the solution of our problem.

Reports of Cases.

TWO CASES OF REFLEX ANURIA IN CHILDREN.

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Case I.

J.W., A FEMALE, aged five years, had been suffering for about twelve months from attacks of abdominal pain associated with tenderness over the right iliac fossa. She had also complained of frequency of micturition for some considerable time. The urine had been examined on a number of occasions for evidence of pyelitis, but without result. Her tonsils, which had been very much enlarged, had been removed two weeks before her present illness. On January 27, 1933, as the attacks of pain were becoming more frequent and severe, her appendix was removed. It was inflamed and was undoubtedly the cause of abdominal pain. The child progressed satisfactorily for the first few days. On the fourth day the temperature rose to 38·9° C. (102° F.) and the child passed a large amount of blood-stained urine. The following day only a few ounces of blood-stained urine were passed, and on the next day there was complete suppression. The child was seen in consultation by Dr. C. B. Blackburn, and the urine was examined by Dr. Tebbutt, who reported as follows:

> Chemical examination of the clear urine after centrifuging showed a small amount of albumin, more in my opinion than would be accounted for by the amount of blood present. Examination of the deposit showed numerous red blood cells, no casts and no pus cells, and cultures were sterile.

Dr. Blackburn stated that he had seen a somewhat similar case in which decapsulation of the kidneys had been done by Sir Alexander MacCormick, and the result of the operation had been satisfactory. Dr. Harry Harris saw the child and suggested a short course of diathermy before the adoption of more radical measures. Three applications of diathermy, each lasting about twenty minutes, were given by Dr. John Hoets, but the kidneys still failed to function. It was thereupon decided to explore both kidneys, remove any obstruction, if found, or decapsulate both kidneys if no obstruction of the ureters was discovered. The operation was done by Dr. Harry Harris, who explored the right kidney first. This was found to be enlarged, apparently owing to congestion; and the right ureter was found to be normal. The kidney capsule was incised along the outer border and stripped backwards towards the pelvis. The left kidney was then explored and was found to be smaller than the right. On examining the left ureter it was found to be distended and tense, but there was no evidence of hydronephrosis. The ureter was traced downwards towards the bladder, but no stone could be felt. The cause of the obstruction was believed to be of the nature of a stricture or spasm near the bladder end. A small incision was then made in the ureter, just below the uretero-pelvic junction, and urine spurted out, obviously under great pressure. The pelvis of the kidney was drained by means of a rubber catheter, which was passed from one of the calyces, through the renal parenchyma, the funnel-shaped end of the catheter being left just within the pelvis. A second smaller catheter was then passed through the incision in the ureter downwards as far as the obstruction. The ends of both these catheters were brought out through the incision in the loin. Both kidneys began to excrete freely after the operation, and the child passed almost clear urine *per urethram*, and the catheter drained about an equal amount from the damaged kidney.

A week later a 15% solution of sodium iodide was injected along the smaller catheter and an X ray picture was taken. By this means it was found that the catheter had passed to within 2·5 centimetres (one inch) of the bladder; and the last 2·5 centimetres of the ureter were evidently constricted, but not completely obstructed, as a thin stream of the iodide solution could be seen passing into the bladder. One week later another X ray photograph was taken, a similar procedure being used, and a larger stream of urine could be seen passing into the bladder. The smaller catheter was thereupon removed from the ureter. A few days later I was able, by means of a cystoscope, to pass first a number 4 and following this a number 5 ureteral catheter along the ureter as far as the kidney. These catheters passed quite easily. The catheter draining the renal pelvis was then removed and the fistula in the loin closed in a few days. The child, one month after the operation, appeared to be quite well, except for the presence of a few pus cells in the urine. She is still quite well at the present time, which is six months later.

Case II.

R.H., a male, aged three years and nine months, was seized on April 2, 1933, with a severe attack of abdominal pain associated with vomiting. The pain was of a colicky nature, and the vomiting persisted for forty-eight hours. The pulse rate was 120 and the temperature was 37·2° C. (99° F.). The abdomen was full and there was some tenderness in the right loin. The urine was clear and did not contain any pus, albumin or acetone. In spite of

the absence of any evidence of acidosis, glucose was given freely both by mouth and *per rectum*, and the child left hospital apparently well after five days. After being home for two days, he had another attack similar to the first; but this time there was not so much vomiting, but there was complete suppression of urine and there was more tenderness in the loin. No urine was passed over a period of thirty-six hours, and the bladder remained quite empty. It was thereupon decided to explore the right kidney.

The operation was done on April 9, 1933, Dr. R. J. Taylor, whose patient this was, assisting. The condition found at operation was somewhat similar to that found in Case I, with the exception that the ureter was not distended. The kidney pelvis was, however, tensely distended, but was not enlarged. The obstruction in this case was at the uretero-pelvic junction. A small incision was made in the pelvis and the urine escaped under great pressure. There was a definite stricture at the uretero-pelvic junction and a rubber catheter the size of a number 8 could not be passed through it, although a large sized ureteral catheter could be passed along the ureter, but would not pass into the bladder. This catheter was left in position and the pelvis was drained in a similar manner to the method to that used in the first case. After a few days an X ray picture was taken after the injection of sodium iodide along the ureter draining the pelvis. The iodide solution passed readily into the bladder.

Immediately after the operation both kidneys resumed their function and excreted urine freely. Both catheters were removed in ten days and the sinus in the loin healed a few days later. The child left hospital about one week later, apparently quite well, except for a mild degree of pyelitis, for which he is being treated at present.

Commentary.

Reflex anuria is exceedingly rare. Cases have been reported, mostly in adults, in which a calculus impacted in one ureter has produced reflex suppression of urine on the other side. In neither case reported above was a calculus the cause of the anuria. In Case I at the time of the operation there was obviously an obstruction at the lower end of the ureter, but since a ureteral catheter could easily be passed through the obstructed region a fortnight later, an organic stricture could hardly have been the cause of the trouble. Possibly there was a condition of achalasia present, due to some defect in the neuro-muscular control. In Case II the obstruction was at the uretero-pelvic junction, and there appeared to be some definite narrowing of the ureter at this point; but why this had not produced a definite hydronephrosis and what determined the sudden complete block is hard to explain.

A HUGE HYDATID CYST IN THE ABDOMEN.

By H. A. MAUNDER, D.S.O., M.B., B.S.,
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K.W., AGED twenty-four years, complained for the past ten years of intermittent epigastric pain and of indigestion. He noticed about ten years ago that his abdomen was increasing in size and had become progressively larger. Lately he said that he had been having "turns of faintness" and had suffered from shortness of breath, especially when he exerted himself. Nevertheless he had continued working on his farm and had assisted with the last season's harvesting. A week before he saw me, he felt that he could not continue working on account of his shortness of breath and the pain in his abdomen.

I saw him on February 10. His face was cyanosed, he was dyspnœic, and he looked ill. His pulse rate was 110 beats per minute; his heart rhythm was irregular, but the heart was not dilated and there were no murmurs. His abdomen was enlarged all over, and in a female would have suggested an eight months pregnancy. It was dull to percussion and a thrill could be obtained. He was very tender in the right iliac fossa.

A paracentesis was performed. No fluid was obtained, but on pressure over the abdomen a few small hydatid cysts were expressed, with some thick yellowish fluid.

Operation was delayed to allow him to attend to some business, but great pain developed in the lower part of the abdomen, with tenderness, most marked in the right iliac fossa. His temperature rose to 38·9° C. (102° F.).

Immediate operation was performed. A right paramedian incision was made, its centre at the umbilicus. A thick-walled hydatid cyst was seen, with large vessels running across it. With the usual precautions against contamination, a small incision was made into the cyst, which was slowly evacuated. Up till this time the patient had been giving the anæsthetist a great deal of anxiety, but with the emptying of the cyst his colour, breathing and pulse became more normal. The incision was enlarged and the cyst was found to occupy every portion of the abdomen from the pelvis to the diaphragm and into both flanks. The contents of the cyst were measured and it was found that thirty-six pints of cysts and fluid had been removed. The cavity was washed out with 1% formalin solution. Very little of the cyst wall could be removed, it was so adherent to the peritoneum. "Marsupialization" was done and two large rubber tubes were inserted and the abdomen was then closed.

For a fortnight after the operation a few small cysts came away daily and then ceased to appear. Then a swelling and pain developed across the epigastrium. A further incision was made above the first, and a second cyst was discovered communicating with the first by a sinus. It was through this sinus that the cysts were being extruded after the first operation; a larger cyst had eventually blocked the sinus, resulting in the pain and swelling complained of.

The second cyst occupied the upper part of the abdomen, extending into each flank, and was adherent to the liver. It contained five pints of cysts and fluid, some of which were bile-stained.

No further daughter cysts were discharged and the patient made an uneventful recovery. There had been no recurrence eighteen months later.

This case is reported because of the huge size of the cysts. Altogether forty-one pints of daughter cysts and fluid were taken away. It must surely constitute a record!

Reviews.

DISORDERS OF THE DUCTLESS GLANDS.

Rowe's "Differential Diagnosis of Endocrine Disorders" is one of the latest additions to the literature on disorders of the ductless glands.[1] It is from the pen of Dr. Allan Rowe, of Boston, Massachusetts. Dr. Rowe is Director of Research, Evans Memorial and Massachusetts Memorial Hospitals, and if for no other reason than this the book is worthy of notice. The study of endocrinology has made considerable progress during the last few years, and this work will mark another important milestone in our knowledge of a difficult subject.

The functioning of the ductless glands, whether normal or abnormal, is a matter of the greatest practical importance, affecting so vitally as it does man's make-up both mental and physical. It is a subject concerning which more accurate knowledge is being slowly but surely acquired; but there are still large gaps to bridge and there is much that remains obscure. The material from which this book has been written represents a very careful and thorough investigation by clinicians and laboratory workers of some five thousand patients suffering from endocrine disorder or from a condition simulating such a disorder. A perusal of the book will confirm the opinion that modern medicine is becoming a very complicated matter.

[1] "The Differential Diagnosis of Endocrine Disorders", by A. W. Rowe; 1933. London: Baillière, Tindall and Cox. Royal 8vo., pp. 230. Price: 23s. net.

The general schedule outlined for a routine examination is a wonderful and fearful thing, and may well dismay the practitioner who visualizes his patient being subjected to such an ordeal. Beyond a few well defined clinical syndromes, the average practitioner has rather a hazy idea concerning the functions, normal or abnormal, of the ductless glands, and especially in these days when he is inundated with literature from various manufacturing firms concerning the virtues of many gland extracts or combinations of extracts, and addition to his practical knowledge would be welcome.

This book represents a praiseworthy attempt to correlate clinical and laboratory findings, and to bring exactitude to bear on much that has hitherto been uncertain and highly speculative. As a work of reference it is undoubtedly of value. It is, we think, not very likely to appeal to the busy practitioner, unless he is prepared to spend a great deal of time in its study.

OPHTHALMOLOGY FOR THE GENERAL PRACTITIONER.

THE high standard attained by the earlier volumes of the "Practitioner's Series" is certainly maintained by Dr. Rugg-Gunn in the new volume on diseases of the eye.[1] The recognition and treatment of all the commoner diseases and injuries are fully dealt with. Where possible, prevention receives adequate emphasis. The author's description of the various forms of conjunctivitis and of sound lines of treatment is particularly good. With a working knowledge of this book the general practitioner will be in a position to know how to treat what it is safe for him to treat, and what is safest in the hands of the specialist.

The tendency in the past for works of this kind to grow with each successive edition till they have outgrown their original plan of service to the general practitioner, makes the publication of new works desirable. In such works there has been a tendency to stress rarities and treatment of unproven worth. This has led to confusion on the part of young practitioners, and it is a fault that is associated with a neglect of essentials. Occasionally even in Dr. Rugg-Gunn's work examples of this lack of balance occur. Nothing, for example, is gained by the recommendation that contact lenses may be used after cataract extraction. The full description of the fitting of such lenses will bring them into disfavour, if others than specialists order them. In the discussion on the significance of vitreous hæmorrhage, the exclusion of a chorioidal sarcoma by transillumination is omitted. The statement that "sarcoma of the choroid is a rare disease" appears to coincide with the attitude of the average optician. It is certainly not that of the honorary staff of any public hospital.

The medical treatment of cataract is unduly emphasized and the dangers of parathormone medication are not mentioned. The almost universal existence of lenticular opacities after the fourth decade should be stressed. Too often patients are told they have cataracts and would be wiser for such information to be withheld for ten or fifteen years, or even for longer. If any ocular disease deserves careful description, it is glaucoma. Optimistically the author states: "Fortunately the diagnosis of glaucoma is easy . . . The age incidence is between fifty and seventy." Neither of these are accurate statements, and it is particularly amongst patients under fifty that the recognition of glaucoma is difficult and yet most important. The danger of prescribing atropine to persons over forty is referred to, but no mention is made of the dangers of even cocaine mydriasis in predisposed eyes. One wishes that "the lay public was well aware of the relation of 'halos' to glaucoma". It may be so in England, but it is certainly not in this country, and this is the fault of oculists. "The visual fields invariably show peripheral contraction" is a statement that suggests that the early recognition of this dread disease does not receive the emphasis that is its due. The examination of the central field by reduced illumination reveals earlier loss. The value of paracentesis in glaucoma when secondary to iridocyclitis is worthy of mention.

The description of the vitreous and its embryological origin hardly gives recent research its due credit. Neither does fusion training of children with strabismus receive adequate attention. It would be wiser to say that the early "stages of treatment are directed to the establishment of simultaneous vision with both eyes and the development of binocular fusion" than to leave this to the final stage, when it is more difficult. All such children without ambiyopia are entitled to fusion training for a time at least, and only if an exceptional angle, a fixed and abnormal correspondence, or some other obstacle presents should early operation be encouraged.

The book is printed clearly on good paper and the illustrations lose nothing by being in black and white and not in colour. A real service has been rendered by the promoters of this series by obtaining Dr. Rugg-Gunn's aid.

[1] "Diseases of the Eye" (Practitioner's Series), by A. Rugg-Gunn, M.B., F.R.C.S.; 1933. London: William Heinemann (Medical Books) Limited. Foolscap 4to., pp. 199, with illustrations. Price: 12s. 6d. net.

OCCIPITO-POSTERIOR POSITIONS.

IN obstetrics, as in other branches of medicine, increase in knowledge is usually gained by someone setting himself the task of explaining why such and such a phenomenon occurs. If he has a well-ordered mind he generally goes over the various factors supposed to be concerned until he finds one or more which may not seem quite to fit in as essential factors.

Dr. Beard has approached the question of the rotation of occipito-posterior positions of the vertex in such a manner,[1] and he states that:

> Under the following diverse conditions: Babies, large, medium, average and small in size; Pelvic floors, perfect, good, fair and poor; Labours, quick and slow; Uterine contractions, strong, average and weak; Flexion, complete and incomplete—all have provided failed, long three-eighths rotations of the occiput.

Present teaching of pelvic floor mechanism, he suggests, fails to explain them.

He argues that it is position rather than attitude of the head that is the main factor in internal rotation, and puts forward a new law for the pelvic floor as follows:

> With the lie longitudinal, that portion or pole of the presenting part which is related to the anterior segment, pubo-coccygeal portion of the pelvic floor, rotates to the symphysis.

He divides cases into the intermediate and true occipito-posterior positions, and emphasizes the importance of the abdominal methods of diagnosis in differentiating between them.

He discusses fully the prognosis, diagnosis and treatment.

There are some statements with which we do not agree, and in some parts his arguments are rather difficult to follow. We find some difficulty in understanding his reason for using the term "pole", as in the above mentioned law for the pelvic floor; the law, in our opinion, would be amply stated with the words "or pole" omitted.

We should like to defer judgement on the correctness of his statement that in the cases termed true occipito-posterior positions forward rotation of the sinciput practically always takes place.

There is no doubt that Dr. Beard has succeeded in bringing forward some interesting points, and it may be that he is correct in his statement that the pubo-coccygeal portion of the *levator ani* is the important part of this muscle in regard to internal rotation.

We have no hesitation in recommending this little book to all interested in obstetrics.

[1] "The Occipito-Posterior Position, its Mechanism and Treatment, with a New Conception of the Rôle of the Pelvic Floor", by R. Beard, M.B., B.S., F.R.C.S., F.R.A.C.S.; 1933. Adelaide: F. W. Preece and Sons. Demy 8vo., pp. 36, with illustrations.

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MALARIA.

THE subject of malaria is becoming more and more important to medical practitioners in Australia. Although there is relatively little endemic malaria in the Commonwealth, Papua and the territories held by Australia under mandate from the League of Nations are heavily infected and are an undoubted menace to the people of Australia. The anopheles mosquito, the vector of malaria, is found throughout Australia, from Tasmania in the south up to the north of the continent and beyond into the Papuan islands and the Solomons. On account of the protean manifestations of malaria, it was thought advisable a year or two ago, when a series of special articles on diagnosis was published in this journal, to include one on the diagnosis of malaria. Dr. W. L. Calov, who wrote the article on diagnosis, consented a few months ago to write for the series now being published another on the treatment of malaria. Shortly afterwards a copy of the *Quarterly Bulletin of the Health Organisation* of the League of Nations for June, 1933, came to hand. In this journal was the third general report of the Malaria Commission dealing with the therapeutics of malaria. This report was found to be so comprehensive that Dr. Calov at once fell in with the suggestion that he should prepare a special abstract embodying its main features. This abstract is published in the present issue.

The Malaria Commission has been at work for some years. In 1925 an experimental investigation was undertaken in several countries to determine the relative efficacy of the total alkaloids of quinquina and cinchonine in comparison with quinine. In 1928 a conference of thirty-two experts from thirteen countries was held, and the scope of the first inquiry was enlarged to include: (*a*) the use of cinchona alkaloids for preventive as well as for curative purposes, (*b*) the value of "Plasmoquine" and other new synthetic anti-malarial preparations which were gradually coming into use, (*c*) the efficacy of intensive treatment by quinine on gametocytes. The results of these and other investigations were communicated to the Commission, and in October, 1932, it was decided to prepare a general report on the therapeutics of malaria, based on these communications. The report was discussed, amended and adopted at a plenary meeting of the Study Commission held at Geneva in April, 1933. It is obvious that the report may be accepted as an authoritative statement of present knowledge of malaria and of the problems associated with it.

The general impression created by the report is the difficulty of the problems discussed in it. The value of the work done on synthetic anti-malarial compounds in recent years is also evident. Malaria, from being a dead subject with little new to be said for it, has become alive. There can be no doubt that the reawakening of interest will lead to further advance. In this regard the discussion on "true causal prophylaxis" is of interest. The work that has been done on "Plasmoquine" and "Atebrin" shows that there is reasonable hope of the discovery of a drug capable, in toxic doses, of destroying injected sporozoites. It is not generally realized that quinine has been valueless from this point of view. Quinine has, of course, been of immense service in malarial therapy, but it has had its demerits as well as its merits; they are now clearly defined. Medical practitioners must realize that there can be no standardized system of treatment. The treatment will vary with the type and virulence

of the infection, and with the patient, who will have to be considered in the light of every characteristic and of every circumstance. Further, mention need be made only of the unwisdom of too early or of too intensive treatment with quinine in the early stages to show that there should be no indiscriminate use of quinine. The treatment of an acute attack should seldom be combined with the treatment of a relapse. There are in this report many other important aspects, such as the question of immunity; they are not of such immediate interest to the clinician. The clinical lesson to be learned from this report is that treatment of the malarial patient calls for knowledge, care and wisdom; each infection offers its own peculiar problems. The special abstract makes this quite clear. Medical practitioners living in infected areas should not fail to secure a copy of the report for their own use.

Current Comment.

TEMPERAMENT AND ARTERIAL HYPERTENSION.

THAT sufferers from hypertensive arterial disease are of a highly strung and worrying disposition has long been a commonplace of clinical observation. Numbers of experienced observers have commented on this in their writings, and more detailed studies have been made showing that the commonest symptoms complained of by the subjects of a raised blood pressure bear a striking resemblance to those noted in the case of functional nervous ailments, in which there are the ætiological factors of psychic maladjustment and worry. But clinical impressions, however valuable, are not always sustained when critical studies are made, and though it is unlikely that any physician of wide experience would question the points just mentioned, a careful inquiry into the matter is welcome.

David Ayman has made a careful review of the temperament or, as he prefers to call it, the personality of patients known to suffer from essential arteriolar hypertension, controlling his observations by including adequate numbers of normal persons.[1] His series contains 182 subjects, drawn from two groups, the hypertensive and those with normal blood pressure; these were further subdivided into the young and middle-aged. The method employed was to draw up a *questionnaire*, the information sought being evidence of calmness, loss of temper, ready excitability, sensitiveness of disposition, shyness, speed of work, physical activity, and various vasomotor phenomena, such as flushing and coldness of extremities. Patients who were unable to make satisfactory replies were rejected. The accuracy of the replies was checked in many instances by obtaining confirmation from near relatives. This method is, of course, one that needs very careful handling, for not only is there the innate risk of the leading question to be considered, but the definite possibility of suggesting the answer to the patient. The author fully recognized this and took all precautions lest his data should be vitiated by any such fallacies. His control series is valuable here, and the results obtained appear to be quite trustworthy. The only temperament characters that were considered seriously in this study were those that had been lifelong. Thus a hypertensive subject who described recent changes of personality could not be regarded as really belonging to the group in which these characters were innate. The final analysis of the results shows that persons with arteriolar hypertension tend to have certain emotional and to some extent also physical reactions much more frequently than people of the corresponding age group whose blood pressure is normal. Confirmation is given of previous work and opinions on the same subject. As the author puts it, he has confirmed his impression that hypertensive subjects tend to be emotionally hyperactive, physically hyperactive, or both. He does not for a moment suggest that all persons who are very active of body and very sensitive of mind will suffer from arterial hypertension, nor does he claim that all hypertensives possess this type of personality. It does seem to be clearly established, however, that persons of this energetic, conscientious, sensitive, rather serious and worrying type are those from whom the greatest number of cases of arterial hypertension will be derived. Of what importance is all this? At the outset it must be clearly understood that a lifelong condition of temperament is implied. There is no question of a temporary change, such as might be observed in the psychoneurotic patient: the existence of an anxiety neurosis, for example, is not at all the same condition as that described, which is just as much part of the person's make-up as the colour of his eyes. Granted that it is possible to recognize this particular group of people, certain young persons may be recognized as possible subjects of arterial disease. To acquaint them of this possibility would be most unwise, but the prudent adviser may be able to do much for them. For example, the recognition of the distinctive personality in a young person who showed that curious fluctuation of blood pressure which we no doubt correctly regard as evidence of angiospastic changes, temporary but significant, would call for an attempt to ease the strain of life in some respect and the exhibition of such mild sedatives as might help him to attain what Wells calls "a glacier-like absence of alacrity amidst the most animated or irritating surroundings".

Now that medical practitioners are looking with perhaps a little more intimate understanding upon

[1] *The American Journal of the Medical Sciences*, August, 1933.

the psychic reactions of their patients, a saner view of the therapeutics of high blood pressure may be looked for. No longer should the physician be obsessed with the one fallacious objective of reducing the systolic pressure. He should realize that the majority of these people are born with a dynamic yet sensitive temperament, not fluctuant, like the manic-depressive type, and not merely unable to withstand the "slings and arrows of outrageous fortune" like the anxiety neurotics. The genesis of this personality is doubtful; it would not seem to be acquired by environment, though no doubt fostered thereby, and the hypothesis that it may be an expression of a physical condition, quite likely of endocrine origin, seems to be of promise. These considerations do not in any way minimize the serious organic side of the more advanced grades of arterial disease, nor do they appreciably touch the treatment of the once established condition, but they stress the keynotes of the medicine of today and tomorrow, the early recognition of disease and the search for its cause.

THE GLUCOSIDES OF DIGITALIS.

THE sixth edition of the British Pharmacopœia illustrates the progress of modern pharmacology. Many of the older and once popular vegetable preparations have been omitted, and the distinct tendency may be noted towards the employment of drugs of definite composition. Some of these, especially many of the newer preparations, are synthetic, but it is obvious that much remains to be done in isolating the active principles of vegetable drugs of known value. Every practitioner of medicine who employs digitalis knows how many varieties of preparation have been introduced, usually for hypodermic use, only to fall into disrepute or mere disuse, while a return was made to old and tried therapeutic friends like the tincture and powdered leaves. In fact, the name "digitalin" as applied to many trade products has come to mean little. More recently, however, Smith has isolated a pure crystalline glucoside, named digoxin, from the leaves of *Digitalis lanata*, and with Grant has succeeded in preparing a *"digitalinum verum"* from the seeds of *Digitalis purpurea* which is not a mixture of glucosides, but a chemically pure substance. The Therapeutic Trials Committee of the Medical Research Council has made these available for clinical trial, and a report is published by E. J. Wayne, from the University College Hospital, setting forth the results.[1]

Exact methods were used, the value of the drug being assessed in the first place by administering it intravenously, in order to avoid the uneven absorption from the alimentary canal. The patients selected for trial were out-patients with auricular fibrillation, those with chronic bronchitis or considerable enlargement of the heart being rejected. No digitalis was given for a fortnight, and patients showing a substantial rise in ventricular rate were admitted to hospital. A constant heart rate was attained by rest and checked accurately by the electrocardiograph both before and after intravenous injection of the glucoside under test. The dose selected was estimated by the results of previous biological assay on animals; working up from a small amount, the effective dose was found. Its action was compared with that of a standard dose of ouabin, and finally the effect of oral administration was investigated. Digoxin was found to act when given by mouth, but the pure digitalin did not affect the ventricular rate, while it caused gastro-intestinal irritation. Three patients were submitted to this laborious therapeutic test, and full details of the results are published in Wayne's paper. The conclusions reached are as follows.

The appropriate dose of digoxin given by the intravenous route was 0·75 to 1·0 milligramme, and a dose of 1·0 milligramme was slightly more active in producing a slowing of the heart than 0·25 milligramme of ouabin. Five milligrammes of *digitalinum verum* injected into a vein produced a similar but slightly less reduction of the ventricular rate. Only digoxin was active when given by mouth. This glucoside was apparently absorbed and eliminated more rapidly than digitalis: its effect became evident one hour after administration and was sustained over six or seven hours. Over-dosage, as in the case of digitalis, produced vomiting, apparently of central origin and not due to direct irritation of the stomach, but there was no evidence that it was either more or less likely to cause vomiting than the parent drug. Digoxin also brought about the expected relief of venous congestion in cases of congestive failure and auricular fibrillation, and where œdema was present initiated diuresis. As above noted, the digitalin was adapted only for intravenous use.

This is a valuable piece of research. No doubt the future of drug therapeutics lies in the further identification and purification of remedies of proved value. Standardization, where possible, is a great advance, but we need also a knowledge of the exact action of the components of a drug which, like digitalis in most of the forms commonly used, is often a mixture of ingredients of varying activity. Of course, it must always be remembered that variations in absorption from the alimentary tract introduce a fallacy in the evaluation of the action of drugs given by mouth. As is well known, tinctures of digitalis of proved and equal potency, as judged by biological assay, do not always yield comparable results in clinical work. Therefore, as the oral route must always be the one most adapted for general use, an accurate knowledge of the variations in active principles, as regards absorbability and capacity for elimination, is essential. There still remains the variability of the individual patient; this is the constant problem of the medical practitioner, but he will always be glad to have other variable factors reduced to a constant.

[1] *Clinical Science, Incorporating Heart*, Volume I, Number 1, 1933.

Abstracts from Current Medical Literature.

RADIOLOGY.

Diagnosis of Bone and Joint Tuberculosis.

MAURICE M. POMERANZ (*American Journal of Roentgenology*, June, 1933) states that the production of bone atrophy in tuberculosis is probably due to many causes. The intense pain produced by the inflammatory process limits function of the part, so that it is immobilized. But pain and disuse occur in most of the arthritides, yet the decalcification is not so marked. The difference in the picture is probably dependent upon the nature of the infecting organism. It is conceivable that there is produced by the tubercle bacillus an osteolytic substance which acts on bone as an extremely toxic agent. The absence of atrophy by no means excludes a tuberculous infection. Contrary to accepted belief, narrowing of the joint space is not a characteristic feature of early tuberculosis. Actually, if it occurs, it comes late in the disease, with certain exceptions. Its existence is dependent essentially on the localization and duration of the destructive process, it is not a special feature of the lesion. While destruction of articular cartilage is present in tuberculosis, the greater force of the destructive impulse is expended on articular cortex. In other words, bone is destroyed before cartilage, so that even in long-standing cases the joint space is relatively unimpaired. The width of the joint is maintained by detached segments of cartilage and granulation tissue, and the persistence of these cartilaginous disks is due to the absence of the proteolytic ferments which are present in pyogenic infections. Thus digestion of the disks does not occur in tuberculosis.

Tuberculous Arthritis.

D. B. PHEMISTER AND C. HOWARD HATCHER (*American Journal of Roentgenology*, June, 1933) state that tuberculous arthritis may be primary either in the bone or in the synovia, but there are no very reliable statistics as to the relative frequency of each. In either case a diffuse tuberculous synovitis eventually develops and the granulations attempt to spread over the surfaces of articular cartilage and destroy it. In some joints the articular cartilages fit accurately together, while in others, particularly the knee, they are of different contour, so that there are large areas of both free and contacted surfaces. In joints with articular cartilages extensively in contact the granulations are kept off the surfaces of the cartilage, but destroy it to some extent by erosion at the margins. In joints with both free and contacted surfaces of cartilage the free cartilage is gradually overgrown and eroded by the granulations. As the disease progresses, in all tuberculous joints the articular cartilage suffers from nutritional disturbances and from the action of tubercle toxins, and subchondral granulations form, usually of a non-specific type and free from tubercles. They gradually absorb the bony articular cortex and deeper portions of cartilage, and may eventually detach the cartilage completely. The loosened cartilage may persist for a long time because of the absence of proteolytic ferments in tuberculous exudate. At this stage the Röntgen characteristics in joints with articular cartilages extensively in contact are: regional bone atrophy, reduction or loss of density of the shadow of bony articular cortex, and preservation of the normal width of cartilage space of the joint. In joints such as the knee, with extensive areas of non-contacted cartilage, the overgrowing surface granulations may destroy the entire thickness of cartilage and underlying bony cortex in a part or the whole of such areas before there is extensive development of subchondral granulations. The Röntgen characteristics of such a joint are: regional bone atrophy, diminution or loss of the shadow of bony articular cortex in the non-contacted regions, and preservation of the shadow of bony articular cortex and of the cartilage space in the contacted regions of condyles and tuberosities. Eventually the entire articular cartilages may be destroyed. This results radiologically in a narrowing or complete loss of the cartilage space of the joint. In the advanced stages the bone may be secondarily invaded at the traumatized points of contact and weight-bearing, resulting in large areas of necrosis. The invasion is usually bilateral at opposite points in the bones, and such areas after a long time may become detached, resulting in kissing sequestra. The Röntgen characteristics of areas of secondarily invaded and necrotic bone are a more or less conical or hemispherical shadow of bone bordering on the weight-bearing portion of the joint, with an incomplete line of demarcation about it, and usually casting a denser shadow than the surrounding living bone. A primary focus in the bone bordering on the joint, if small, may break down, leaving a pit or cavity. However, a large focus becomes separated as a sequestrum and retains its original density. Tuberculous arthritis in young children varies somewhat in its pathology from that in adults. In the larger joints, and in particular the knee, with relatively thick articular cartilages, destruction of the non-contacted portions by surface granulations is less complete than in adults. Also subchondral granulations do not frequently detach articular cartilage, leaving it free in the knee joint. In the smaller joints with thinner cartilages, and in older children, the course is more nearly like that in adults. Partitioning of the knee joint by healing processes occurs oftener, and different degrees of involvement within the partitions are more pronounced in children. Primary bone lesions that can definitely be identified either by Röntgen rays or at operation are more frequently located in the metaphysis than in the epiphysis. Secondary bone invasion is usually bilateral in the joint and most marked at the points of weight-bearing, as in adults, but it usually results in destruction rather than sequestration of the necrotic bone, regardless of the extent of the involved areas.

Pulmonary Emphysema Associated with Arrested Pulmonary Tuberculosis.

KENNON DUNHAM (*Radiology*, September, 1933) states that emphysema of a more or less severe degree is a constant sequela of arrested tuberculosis. It is not unusual for emphysema to be more marked in one lung than in the other, and it may even be more marked in an upper lobe than in another lobe of the same lung. With good stereoscopic films this can be detected by the greater separation of the trunks in the particular lobe involved. Emphysematous blebs are a late manifestation and indicate severe emphysema. In certain cases in which injections with lipiodol are carried out, the air cells fail to fill, although the bronchi fill well. This occurs irrespective of the quantity or temperature of the oil used. These cases of uninjected air cells are all cases of emphysema. Emphysematous blebs will never fill with iodized oil and, indeed, cavities seldom fill. Many patients are returned to the sanatorium after discharge because they have a severe cough and expectoration and the chest is full of râles; the X ray film shows no new pulmonary lesion. The clinician is prone to believe that there has been an extension of a tuberculous lesion which the X ray examination does not reveal. These symptoms and signs are due to emphysema, and after a few weeks in bed the patient rests easily, the cough subsides, and the râles can no longer be heard. The important point is that when a patient with arrested tuberculosis is examined, no matter for how long the process has been arrested, no matter how slight the lesion, the extent to which pulmonary emphysema is causing the trouble should be considered and determined. Rest is the only treatment, and the later the diagnosis is made, the more rest is required.

Atelectasis as a Complication of Pulmonary Tuberculosis.

E. A. GATTERDAM (*Radiology*, September, 1933) states that massive atelectasis of one or more lobes of a lung is a fairly frequent complication of pulmonary tuberculosis, and the tendency is for the atelectasis to remain permanent, with the consequent formation of a fibrotic lung. The chief causes of the bronchial obstruction are aspiration of a caseous plug, hæmorrhage with clot formation, plugging of a bronchus with thick, tenacious sputum, pressure from an

enlarged lymph gland, and possibly contraction of a cicatrix. The lung volume is greatly reduced and a marked negative pressure results. This forces the heart and mediastinum and diaphragmatic arch towards the affected side. The atelectatic tuberculous lung becomes fibrotic and the contraction of this scar tissue further increases the negative pressure. The massive atelectasis generally develops successively and suddenly, rather than progressively and slowly. The tendency of a massive atelectasis is to cause collapse of lung cavities as well as lung tissue, and in many cases therefore it produces a beneficial result on the course of the disease. This apparently does not hold true in cases in which the cavities have a thick wall or are situated in an apex. When cavities do not close, the tendency is for them to enlarge, owing to the increase of negative pressure; consequently there is a progression of the disease. In these cases pneumothorax or some form of artificial compression is the treatment of choice.

PHYSICAL THERAPY.

Toxic Goitre.

ISRAEL BRAM (*Archives of Physical Therapy, X-Ray, Radium*, July, 1933) classifies toxic adenoma as being synonymous with hyperthyreoidism, toxic goitre and thyreotoxicosis, and states that it is a neoplastic condition requiring surgical treatment. However, X ray treatment in combination with rest and other medical measures should be used first to prepare the patient for a relatively riskless thyreoidectomy. The author favours Röntgen therapy as a valuable supplement in the rational treatment of Graves's disease, and with careful medical management at the same time he considers it is the method of choice. Over two thousand patients with Graves's disease have been personally followed up by the writer for a period of from three to ten years, and he states that of these over 90% are enjoying perfect health.

Diathermy Treatment of Dementia Paralytica.

W. FREEMAN, T. C. FONG AND S. J. ROSENBERG (*The Journal of the American Medical Association*, June 3, 1933), in view of the disadvantages of malaria in the treatment of *dementia paralytica*, undertook the treatment of fifty such patients by diathermy. They state that they have been unable to produce the almost universally favourable results that have been reported from other clinics. In forty-four of the cases a full series of diathermy treatments was administered, the temperature being raised to more than 40° C. (104° F.) during a period of from two to five hours. Some of the patients became very restless during the period of rising temperature, and in two instances extensive second degree burns followed shifting of the electrode. After treatment there was marked prostration and inability to take food, and convulsive seizures were noticed to be much more frequent in the patients treated by diathermy than in those treated by malaria. In several scores of malarial cases no antisyphilitic therapy was given following treatment, yet improvement was usually maintained, but after diathermy prompt relapse ensued once drugs were omitted. The results of diathermy are tabulated. Of the fifty patients, ten showed improvement, twenty-six were not improved, and fourteen died. The authors feel justified in stating that diathermy is not altogether an innocuous treatment, but is sometimes dangerous, especially in persons subject to convulsive seizures. They have observed no case of improvement with diathermy alone, and in many cases previous and subsequent treatment by preparations of arsenic and bismuth has not prevented the patients from deteriorating.

Experience with Hyperthermia.

F. WALINSKI (*Deutsche Medizinische Wochenschrift*, March 17, 1933) has treated 353 patients by hyperthermia during the past five years. Treatment consists of giving the patient ten cubic centimetres of a 20% solution of sodium chloride intravenously in order to lessen perspiration and to act as a cardiac tonic. Five minutes later the patient is put into a bath which has a temperature of 37·2° C. (99° F.) and the temperature is gradually increased to 41·5° C. (107° F.)—as much as the patient can tolerate. The body temperature rises, and at the first treatment it should not exceed 39·4° C. (103° F.). In these cases no death has occurred, whilst in malarial therapy there is a mortality of 8% to 14%. Contraindications to this treatment are severe cardiac and renal damage. Even patients with a systolic blood pressure of 190 millimetres of mercury withstand a temperature of 40·2° C. (104·5° F.) quite well. With this therapy there is an increased salt retention in the body and there is also increased protein breakdown, whilst in the blood a leucocytosis occurs. By this means moderately good to good results were obtained in *tabes dorsalis*, cerebro-spinal syphilis, progressive paralysis, multiple sclerosis, post-encephalitic Parkinsonism, myelitis, polyneuritis, sciatica, chronic arthritis, pyelitis, bronchial asthma, and inflammatory adnexal disease. Amyotrophic lateral sclerosis, gonorrhœa, herpes, psoriasis, and nephritis were unaffected. This therapy has the advantage over other methods of fever therapy in that it is harmless, and also that its dosage can be better controlled.

Electrocoagulation in Cervicitis.

H. E. KIMBLE (*Archives of Physical Therapy, X-Ray and Radium*, September, 1933) discusses cauterization and coagulation of the cervical canal. He considers that with coagulation a soft flexible lining is obtained, in some respects resembling the tonsil bed after removal of the tonsils by coagulation. The author mentions that it is only necessary to coagulate deeply enough to obtain free drainage and to destroy all devitalized tissue in the laceration. Only one treatment is needed in 80% of the cases, and complete recovery is attained in from six to eight weeks after treatment, even in the severest cases, with rapid subsidence of complicating pelvic pathological change. Among two hundred cases cure is claimed in one hundred and sixty-eight, and improvement in thirty-two, the latter being cured symptomatically, long-standing fibrosis of the cervix preventing return to normal size. The electrocoagulation method of treatment of cervicitis is a prophylactic treatment of cancer of the cervix.

Benign Uterine Hæmorrhage: Its Treatment with Radium.

H. H. BOWNING, R. E. FRICKE AND A. U. DESJARDINS (*American Journal of Roentgenology*, April, 1933) state that for benign hæmorrhage of the menopause not related to uterine fibromyoma, intrauterine treatment with radium is practically a specific. The major contraindication is the history of or the presence of adnexal inflammatory disease, and with this complication both vaginal and external treatment with radium has proved a safe procedure in a limited number of cases. Among patients of the younger age groups bleeding can be controlled and the condition cured by intrauterine application of radium in the majority of cases; however, in a small percentage of cases premature menopause will occur in the presence of hypoovarian function that is not recognizable beforehand. Hence the possibility of permanent amenorrhœa and loss of reproductive power must be explained to the patient before treatment, and it is wise to employ all possible medical and minor surgical measures first. If radium is employed, a small dose should be used, with repetition in a few months if the desired effect is not attained. If radium fails, final recourse must be to surgery. In the treatment of fibroid tumours causing menorrhagia, probably selection of cases is too conservative. Intrauterine treatment with radium, in conjunction with external application of radium or Röntgen rays, affords a good result even with large fibromata, and is worthy of consideration if the pelvis is otherwise normal and the surgical risk excessive. If the diagnosis is at all questionable, operation is preferable. There is a large group of patients with fibromata whose hæmoglobin is of low concentration and whose resistance is so diminished that they constitute poor surgical risks; treatment with radium and Röntgen rays, if not curative in themselves, will build these patients up so that they are more suitable for subsequent operation. The author describes the results of the treatment at the Mayo Clinic of 418 patients who suffered from benign uterine hæmorrhage.

Special Abstract.

THE TREATMENT OF MALARIA.

THE study of malaria languished for some thirty years after Ross's discoveries. Then came the artificial induction of malaria as a therapeutic measure in general paralysis; this opened up fresh fields for research and provided the investigator with virgin soil to experiment upon. Next came the preparation of the two synthetic drugs, "Plasmoquine" and "Atebrin". These drugs have important effects on the malaria parasite in various phases of its development, and their use has shed new light on the study of malaria. Great changes have taken place; and they have occurred so rapidly that the student is hard put to it to keep pace with them. It is time, then, that modern knowledge and modern views should be collected and set down so that they may be conveniently available to all. This has recently been done, as far as therapeutics are concerned, by a select committee of the League of Nations Malaria Commission.[1] The committee consists of Colonel S. P. James and Professors C. D. de Langen, P. Mühlens, B. Nocht, G. Pittaluga and Ed. Sergent.

General Aims.

The report opens with a discussion of the general aims in the treatment of malaria. It is pointed out that, when the League of Nations Malaria Commission was created in 1923, the treatment of malaria was synonymous with the administration of quinine. The Commission realized that the cost of quinine was an important factor against the possibility of universal distribution of the drug. The primary aim, therefore, was the cheapening of quinine. At the same time the Commission did not lose sight of the possibility that one of the other cinchona alkaloids might be effective and cheap or that a mixture of the alkaloids of cheaper cinchona bark might serve. An outcome of the Commission's research was the preparation of a new cinchona product to be called "Totaquina". This is a mixture containing not less than 70% of the crystallized alkaloids, of which not less than 15% is quinine. There are two methods of preparation in commerce: one by precipitating the alkaloids from the bark of *Cinchona succirubra* or *Cinchona robusta*, and the other by taking the residue after the manufacture of quinine sulphate from *Cinchona ledgeriana* and adding sufficient quinine and other alkaloids to bring it to the required strength. Totaquina is now an official preparation of the British Pharmacopœia. It has been tested for activity against bird malaria, and trials have been made with it in the treatment of malaria in man; but the Commission considers that there is insufficient evidence yet to enable the making of recommendations concerning dosage, mode of administration and other details. While the quinine problem was under consideration "two events of outstanding importance in the history of malaria research occurred". The first of these was the application on a large scale of Roehl's method of testing the efficacy of drugs against bird malaria; the second was the use of malaria therapy in the study of malaria itself.

In this chapter of the report the discovery of the various synthetic remedies is mentioned, and it is pointed out that the merits and defects of quinine have for the first time been clearly defined and described. Quinine is generally satisfactory on account of its action on the trophozoites; but it has the defects that it has no action on the sporozoites, and very little on the gametocytes, and its curative effect is not always lasting. Furthermore, it can no longer be considered satisfactory to make use of a standard system of treatment by means of quinine, either for malaria generally or for malaria caused by any particular species of parasite. "It has become all important to know what is, in general, the clinical virulence of the particular strain of the parasite . . . what is the usual course of the disease in treated and untreated infections with that strain, and what is the patient's status as regards tolerance or immunity to its clinical effects." There is a difference in the virulence, not only of different species, but also of "different geographical races or strains of the same morphological species". Of further importance in treatment is the information that persons who suffer repeatedly from malaria acquire a specific tolerance or immunity to the particular strain with which they are infected, and that too early or too intensive treatment may prevent the acquisition of this tolerance or immunity. It has been shown that quinine is not a true prophylactic against malarial infection, and that the small daily dose of quinine acts, not by preventing infection, but by suppressing or mitigating clinical symptoms.

In the application of anti-malarial measures by means of drugs administered to great numbers of the people of malarious countries, the aim is not necessarily to provide the most efficient drug, but rather the most readily available drug that is capable of mitigating the severity of the disease and saving life. Indeed it may be considered inadvisable to use a highly efficient drug in a highly malarious country; in many such countries almost every member of the native population harbours malaria parasites in his blood, yet none above a few years of age suffers from the clinical effects of malarial infection; these people have acquired an immunity that perhaps they would not have acquired if they had been subjected to the frequent administration of anti-malarial drugs. In such countries the object is to discover at what period of a native's life temporary curative measures are most urgently required or would be of most value.

Particular Aims.

The second chapter of the report deals with particular aims in the treatment of malaria by drugs. These are as follows: (i) True causal prophylaxis by destruction of sporozoites as they are injected by the mosquito. (ii) Clinical prophylaxis by the destruction of merozoites and schizonts during the incubation period of the disease. (iii) Treatment of the malarial attack by destruction of schizonts. (iv) Prevention of relapses by destruction of schizonts and possibly other forms (as yet unknown) that may be responsible for relapses. (v) Prevention of the spread of the disease by destruction of gametocytes.

Causal Prophylaxis.

The problem of true causal prophylaxis is usually considered to be that of finding a drug that, circulating in the blood, will destroy all sporozoites before they can attach themselves to red blood cells. But, despite Schaudinn's work, it is not known that the sporozoites do enter the red blood cells immediately or at all; for example, they may enter subcutaneous connective tissue cells where they remain quiescent for long periods, or they may enter cells of the reticulo-endothelial system and undergo a process of development similar to that of the hæmoproteus of avian malaria, eventually producing merozoites, which enter red corpuscles and commence the stage of schizogony. It is pointed out that the problem is most likely to be solved by a study of malaria of monkeys and birds.

Quinine as a Prophylactic.—As a result of many trials made at Horton Mental Hospital, England, it was found that quinine, even in therapeutic doses, did not prevent the development of malaria after the bites of infective mosquitoes. In many instances clinical evidence of malaria appeared while quinine was still being administered; in others it appeared after the cessation of quinine administration.

"Plasmoquine" as a Prophylactic.—In England more than fifty trials have been made to ascertain whether "Plasmoquine" is a true causal prophylactic against malaria. From the results of these the following conclusions are drawn: (i) Administered in the maximum therapeutic doses (0·08 gramme a day, reduced if necessary to 0·06 gramme after the fourth day) on the day of the infective bite and for seven days thereafter, "Plasmoquine" has the effect a true causal prophylactic should have. (ii) In a daily dose of 0·06 gramme during the period of liability to infection and for six or seven days thereafter, "Plasmoquine" always prevents the onset of a malarial

[1] League of Nations: Quarterly Bulletin of the Health Organisation, June, 1933.

paroxysm within the ordinary incubation period, but does not always prevent infection; clinical manifestations of malaria may develop at a later period (usually six to ten months after the infection). (iii) In a daily dose of 0·04 gramme, for eight days, "Plasmoquine" is effective if there is only one infective bite; but, when taken in this dose over a period during which there are several infective bites and for five to ten days after the last one, it has failed to prevent infection in some 50% of cases. (iv) In doses of 0·01 to 0·03 gramme a day, "Plasmoquine" cannot be relied on as a prophylactic.

It has been remarked that failures with "Plasmoquine" in doses of less than 0·04 gramme a day may be explained in part by the virulence of the strain of plasmodium used; but the Commission points out that "what is required of a true causal prophylactic is that it should be effective under the most severe hyperendemic and epidemic conditions in which persons would be bitten by infective mosquitoes several times a week". In such conditions "Plasmoquine" would be infective only in a dose of at least 0·06 gramme daily, a dose that is too near the toxic to be taken for more than a few days.

"Atebrin" as a Prophylactic.—Trials so far indicate that "Atebrin" in ordinary therapeutic doses prevents the development of clinical manifestations of malaria within the usual incubation period, but does not necessarily prevent their development at a later date (33 weeks after infection in one case, 37 weeks in another).

Other Drugs as Prophylactics.—The following drugs have been found to possess no true prophylactic action: Hydroquinine bihydrochloride, "Malarcan" (a preparation of hydroquinine), cinchona febrifuge *A*, "*R* 118" and "*R* 36" (amino-quinoline derivatives). "Fourneau 710" given in maximum therapeutic doses in one case caused delay for twenty-six weeks in the development of clinical manifestations of malaria; but it caused cyanosis and severe vomiting. In another case, when the drug was given in a dose of 0·03 gramme for five days, the patient developed malaria fourteen days after infection.

Clinical Prophylaxis.

Clinical prophylaxis is not concerned with the prevention of infection, but with the prevention of the development of clinical manifestations of malaria. If it is successful, the parasites continue their life cycle in the human host, but do not multiply sufficiently to cause symptoms. The difficulty is that quinine has little effect "until a febrile attack is imminent or has already occurred". Furthermore, the administration of quinine immediately before the date of an anticipated recurrence of malaria fever does not prevent the recurrence. It has been shown, however, that infected persons taking quinine regularly suffer only mild paroxysms of malaria; if such persons cease to take quinine, severe malarial paroxysms are apt to occur within a few days. The Commission concludes that quinine is the best drug to use; it should be taken in a dose of 0·4 gramme (six grains) a day during the whole period of residence in a malarious country, and for several months afterwards.

"Atebrin" taken in a dose of 0·1 gramme daily is also effective as a clinical prophylactic; but it has the disadvantage of dying the skin yellow. In addition it is not yet known whether continued administration of "Atebrin" in this dosage is harmful or not.

Treatment of the Attack.

In the treatment of malaria and in the assessment of the therapeutic value of any specific drug, five of the most important factors first to be considered are: (i) the species of parasite; (ii) the strain of the particular species; (iii) the dose of infection; (iv) the stage of the disease (primary paroxysm or relapse); (v) the patient's natural or acquired resistance. The importance of recognizing the species of the responsible organism is obvious; the necessity of varying therapeutic measures according to the type of infection has become all the more apparent with the discovery of *Plasmodium ovale*, which is so benign that it requires scarcely any treatment for its eradication.

Great variability in the virulence of *Plasmodium falciparum* has been noted in various parts of the world. In the Netherlands it has been found that various races of *Plasmodium vivax* react differently to the same remedy. The Commission urges the necessity of local investigation into the resistance of various strains of parasites to quinine.

The influence that the dose of infection may have on therapeutics is a matter on which there is little information. It is believed that primary malarial attacks induced by the bites of many mosquitoes are more difficult to control than others, and it has been found that numerous inoculations with even such a benign parasite as *Plasmodium ovale* over a few days, may cause the development of severe manifestations of malaria.

Great importance is attached to the necessity for a knowledge of the stage of the disease. Quinine has little or no effect during the incubation period and very little on the first or even the second day of the initial fever. It is much more effective when the patient has had several paroxysms, and most effective when the fever is beginning to decline and the parasites to decrease in numbers as a result of the building up of the patient's resistance. "A relapse is always more amenable to quinine than is a primary attack." The object in treatment should be to assist the patient to acquire tolerance or immunity. Sufficient quinine should be given at any particular stage to be effective without interfering with the defensive mechanism; to give large doses indiscriminately in all cases is wrong.

General Rules for the Treatment of an Attack.—Several pages are devoted to the discussion of general rules to be observed in the treatment of an attack of malaria. Among other things, the Commission points out that, in addition to its possible interference with the strengthening of the human host's defensive mechanism, quinine (and presumably the new synthetic drugs) in large doses, is no more effective than in moderate doses; large doses should therefore be avoided, and the course of treatment with curative doses should not exceed seven days. Quinine should be administered intravenously in acute cases with dangerous symptoms; but the use of intravenous or intramuscular injections as a routine is deprecated.

The Commission believes that a period of a week should be allowed to pass after the conclusion of the treatment for the attack, before treatment to prevent relapses is undertaken. A person who has received treatment for five to seven days will not suffer a relapse for at least a week and the administration of specific drugs during this period is of no value.

It is seldom or never advisable to combine a plan for the prevention of relapses with one for the rapid cure of an attack. In particular, the Commission stresses the need for caution in combining "Plasmoquine" with quinine or "Atebrin" in the treatment of acute primary attacks. "Plasmoquine" is not effective against the schizonts (the fever-producing parasites), and much remains to be learnt concerning its toxicity.

Specific Drug Therapy.—The Commission states that in the treatment of acute attacks of malignant tertian malaria, "Atebrin" is preferable to quinine. It may be given in a dose of 0·1 gramme three times a day for five to seven days. As much as 0·6 gramme may be given on the first day of treatment if it is considered necessary. A suitable dose for intravenous administrations is 0·3 gramme in five cubic centimetres of normal saline solution. Quinine and "Atebrin" seem to be equally effective in the treatment of benign tertian and quartan malaria. Neither quinine nor "Atebrin" fulfils the requirements of a *therapia magna sterilisans*.

Treatment to Prevent Relapses.

The Commission remarks that treatment for the prevention of relapses should be based on a knowledge of the natural course of the disease. The object is to assist the patient to acquire immunity.

Benign Tertian Malaria.—As a general rule, the course of benign tertian fever is roughly as follows: (i) after recovery from the primary attack there is a period of about two weeks during which there is no fever, and no parasites can be found in the peripheral blood; (ii) there is then a period of about two months during which relapses

are likely to occur; (iii) this is followed by a period of some five to eight months during which there is not much likelihood of relapse; (iv) at the end of this time the liability to relapse is about twice as great as at any earlier period; (v) after the lapse of a period of ten months from the time of recovery from the primary attack there is little liability to relapse, and recovery is usually complete within a year.

In the light of this knowledge treatment to prevent relapses of benign tertian fever should be roughly as follows:

No quinine or other specific drug is given during the fortnight following recovery from the primary attack, unless there is a recrudescence. At the end of this period a watch is kept for premonitory signs of recrudescence; if necessary the blood is examined; specific drugs are given as in the treatment for a primary attack, when parasites are found in the blood or a paroxysm of fever occurs. If there is a second recrudescence the patient is allowed to have several paroxysms if possible before the specific drug is administered; by that time, in many cases, spontaneous recovery has commenced, and small doses only (say 0·3 gramme of quinine a day for fifteen days) are required. A watch is kept for relapse between the seventh and tenth months; if it occurs, several paroxysms should be permitted before the administration of specific treatment.

An alternative method is the administration of quinine in a dose of 0·3 gramme (five grains) to 0·4 gramme (six grains) every day, commencing about one week after recovery from the primary attack.

Malignant Malaria.—Malignant malaria, in its general clinical course, is an acute disease consisting of a severe attack followed usually by several progressively milder recrudescences at relatively short intervals. The average number of recrudescences is four. "The duration of the disease as manifested by febrile attacks is seldom less than a month and seldom longer than six months." After the patient has recovered from the primary attack no treatment should be administered until the onset of a recrudescence; treatment should then be the same as for the primary attack, excepting that, if "Atebrin" has been used in the first place, quinine should be used in the second. The drugs should be used alternately in any subsequent relapses. By this means early permanent cure is likely.

Quartan Malaria.—Insufficient is known about relapses of quartan malaria to indicate correct lines of treatment for their prevention. "On general grounds it is usually recommended to adopt the same plan as for the prevention of benign tertian relapses."

Treatment to Prevent Spread of the Disease (Gametocyte Therapy).

Treatment to prevent the spread of malarial infection depends on the destruction of gametocytes or the prevention of their development. "Malaria differs from every other known disease in not being communicable during its acute stage." The blood of a malarial patient is not infective to the mosquito until some seven to ten days have elapsed after the commencement of fever, because it is not until then that gametocytes appear in the peripheral blood. It is important also that gametocytes can be found in the peripheral blood in only a small proportion of cases. They appear in greatest numbers after primary attacks and early recrudescences; that is, their numbers are directly proportionate to the numbers of asexual forms present during the periods of fever. For these reasons in highly malarious countries they are most commonly found in the blood of infants and very young children. The Commission points out the importance, before the commencement of a system of gametocyte therapy, of finding "at what age-periods of the populations concerned these forms of the parasite are most prevalent" and of concentrating "our efforts on persons within those age-periods". It is pointed out that the appearance of gametocytes in the peripheral blood is often a fleeting phenomenon, and it is rare for them to persist for more than a few days; they may disappear and return later. Failure to recognize these peculiarities may have been the cause of fallacious findings in regard to gametocyte therapy. The Commission remarks that, "until more knowledge of the origin of gametocytes becomes available, it is good practice to act on the view that they arise from asexual parasites, and that, if a brood of these parasites can be destroyed, the source of supply of the corresponding brood of gametocytes will be cut off".

There is no drug that, apart from its action in destroying asexual parasites and thus cutting off the source of gametocytes, can prevent the appearance of gametocytes in the blood. All that can be done is to endeavour to destroy gametocytes as quickly as possible after they have entered the peripheral circulation. This is simple as far as benign tertian malaria and quartan malaria are concerned; for quinine destroys the gametocytes of *Plasmodium vivax* and *Plasmodium malariæ* almost as readily as the asexual forms of these parasites. The destruction of the gametocytes (crescents) of *Plasmodium falciparum* presents a different problem. Quinine has no effect on them; neither, probably, has "Atebrin". "Plasmoquine", however, has a powerful destructive action on the crescents. The effects last for about three days; therefore it has been advised to give 0·02 gramme to 0·04 gramme twice a week when crescents are in the peripheral blood. "It seems probable that the minimum effective dose varies in different localities and circumstances. In the opinion of the Commission, the whole subject requires much more experimental study than it has yet received."

Notes on Particular Remedies.

Quinine.—The remedial effect of cinchona bark in malaria has been known for 300 years. Quinine and other alkaloids of cinchona have been used for over 80 years. At the present time about £2,500,000 are spent annually on the purchase of quinine—sufficient for the effective treatment of 50,000,000 patients. "These figures are a tribute to one of the most remarkable drugs in the world; but no informed person who considers them can fail to regret how slow has been the advance of knowledge on the mode of action of the remedy, the factors by which its remedial action is influenced, and how best to use it for therapeutic and prophylactic purposes." The Commission publishes a note provided by Professor B. Nocht, who mentions three main theories of the action of quinine. The first is that quinine is directly parasiticidal; the second that it acts by enhancing the defensive powers of the organism, and the third (Morgenroth's repulsion theory) that by entering the red corpuscles it renders them unsuited as food for the parasites. Professor Nocht favours the second theory, and gives arguments in its favour.

Quinidine.—It appears that the immediate effect of quinidine is as good as or slightly better than that of quinine. This is of little practical importance, however, as the amount of quinidine in cinchona bark is very small. Moreover, it has a more potent depressing action on the heart muscles than quinine.

Cinchonidine and Cinchonine.—Quinine, cinchonidine and cinchonine are of about equal value when used in the ordinary therapeutic doses.

Hydroquinine.—It has been shown that hydroquinine is superior to quinine in regard to its tolerability by the human subject and its effect on malaria. "Malarcan" and "Tebetren" are proprietary drugs containing hydroquinine.

Totaquina.—The results of experiments on bird malaria and human malaria suggest that totaquina type I (consisting of the total alkaloids of *Cinchona succirubra* or *Cinchona robusta*), used in ordinary therapeutic doses, should be about as valuable as quinine in the same doses. "If this is so, and if this type of totaquina can be obtained more cheaply than quinine, it would be advantageous to use it for general purposes instead of the single alkaloid."

"Plasmoquine."—In the Commission's opinion the use of "Plasmoquine" should be restricted to the destruction of gametocytes. A chemotherapeutic remedy should not be used for general purposes unless the dose that kills the parasites is very much smaller than the dose that the human host will tolerate without injury. "Plasmoquine" does not fulfil this requirement.

"Fourneau 710."—"Fourneau 710" is allied to "Plasmoquine"; but its carbon chain is shorter. It is said to be somewhat more toxic than "Plasmoquine", and its gametocidal action is about the same.

"Atebrin."—"Atebrin" is said to be the dihydrochloride of a derivative of alkylamino-alkalylaminoacridin. It is a yellow crystalline substance and is usually sold as tablets, each containing 0·1 gramme. When taken by mouth it is quickly absorbed by the small intestine. It is excreted in the urine and bile unchanged. It is relatively non-toxic; its minimum lethal dose is about the same as that of quinine. The only disagreeable effects of its administration in therapeutic doses seem to be epigastric pain in a few cases, feelings of excitement and "light-headedness" (rarely) and yellow staining of the skin and urine after it has been taken for five days or more. The staining is due to the dye; it may persist for a fortnight after the cessation of treatment. The drug can be recovered from the urine for at least eight days after the last dose.

"Stovarsol."—"Stovarsol" is an organic arsenic compound that has been used in the treatment of syphilis and amœbiasis. Its effect on the parasites of malaria seems to be slight. When it was found that arsenical preparations in general had only a feeble action against malaria parasites, it became the custom to combine them with quinine. "Quiniostovarsol" and "Quinine Troposan" were therefore developed. Several workers have experimented with these preparations on behalf of the Commission. The results were indeterminate.

"Quino-Plasmoquine" and "Plasmoquine Compound."—"Quino-Plasmoquine", or "Quinoplasmine", is prepared in tablets containing 0·01 gramme of "Plasmoquine" and 0·3 gramme of quinine sulphate. Tablets of "Plasmoquine Compound" contain 0·01 gramme of "Plasmoquine" and 0·125 gramme of quinine sulphate.

Methods of Studying Therapeutic Problems of Malaria.

Tests with Laboratory Animals.

Avian Malaria—Type "Proteosoma".—Birds are inoculated intramuscularly or intraperitoneally with blood containing the parasites of avian malaria (usually *Plasmodium relictum*). The drug to be tested is administered through an œsophageal tube, the usual dose being one cubic centimetre of a solution of known strength per twenty grammes of body weight. Tests are made with the object of ascertaining the maximum strength of solution that the birds can tolerate in this quantity. The drug is then administered in these doses over a period, and the blood is examined regularly to find whether there is delay in the appearance of the parasites. If there is delay, higher dilutions are employed, until the minimum dose that can cause delay is found; for example: canaries can tolerate one cubic centimetre per twenty grammes body weight of a one in 200 solution of quinine hydrochlorate, and dilutions up to one in 800 have a distinct effect in delaying the appearance of parasites in the peripheral blood; the therapeutic coefficient of quinine is therefore said to be 1 : 4. The chief use of the test is in the information it gives concerning whether or not the drug used is worthy of further study. The chief limitation of the test is that it gives no information concerning the value of the drug in the treatment of human malaria.

Avian Malaria—Type "Halteridium".—The parasite usually employed is *Hæmoproteus orizivoræ*, of which only the gametocytes appear in the peripheral blood. The object of therapeutic tests is to ascertain whether the drugs used are gametocidal. Results are usually expressed as the relationship of the optimum curative dose to the maximum tolerated dose. If the maximum tolerated dose is 0·00025 gramme and the optimum curative dose is 0·000025 gramme, the therapeutic coefficient is given as ten.

Monkey Malaria.—A species of malaria parasite, occurring naturally in monkeys of the genus *Cercopithecus*, when transmitted to *Macacus rhesus* or *Macacus sinicus*, causes an acute disease that proves fatal if untreated.

Therapeutic tests with quinine and "Atebrin" have been performed.

Biological Tests on Human Malaria.

Numerous tests have been performed on persons who have been deliberately infected with malaria in the treatment of general paralysis. In any tests of therapeutic or prophylactic drugs natural conditions should be imitated as closely as possible. It is essential that the patients should be infected by the bites of mosquitoes and not by the direct inoculation of malarial blood.

A trustworthy test of a drug in treatment can only be made on patients suffering a primary attack. A further condition is that the patients should all have remained untreated for the same length of time before the commencement of the test. All patients must have been infected by the bites of approximately the same number of mosquitoes, carrying the same strain of the specific parasite. Regular daily counts of the parasites present in the peripheral blood must be made. The results of the administration of the smallest effective doses of the drug to be tested are compared with those obtained by the use of quinine.

A brief description is given of the most suitable methods of carrying out tests in artificially induced malaria and malaria contracted in the field.

Public Health Measures.

In the summary and conclusions of the report the Commission discusses, among other matters, the methods that may be adopted by health authorities in highly malarious countries. It is pointed out that, in certain communities, practically all persons above one year of age harbour malaria parasites in their blood continuously. Children, despite enlarged spleens and chronic malarial infection, appear to be healthy and to enter into play with the pleasure and zest of normal children. In such cases, quinine should be used only at special age periods and to meet with particular emergencies. Of greater importance are attention to diet and other measures for improving general health.

The Commission writes: ". . . . in 1927, the Malaria Commission was led to advise malarious countries to be content with the limited aim of organising their medical and public health services on the principle that the correct antimalarial practice is an endeavour to reduce the severity and fatality of the disease rather than to undertake the more radical measures which are necessary when the object aimed at is complete elimination of the parasites in the area concerned."

British Medical Association News.

MEDICO-POLITICAL.

ANNUAL MEETING OF THE DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS OF MEMBERS WITH THE COUNCIL OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

THE annual meeting of the delegates of the Local Associations affiliated with the New South Wales Branch of the British Medical Association with the Council of the Branch was held at the British Medical Association House, 135, Macquarie Street, Sydney, on October 6, 1933, Dr. A. W. HOLMES À COURT, the President, in the chair.

The following delegates were present: Dr. F. R. Coyne (Balmain District Medical Association), Dr. Kevin Byrne (Canterbury-Bankstown Medical Association), Dr. A. T. Roberts (Central Nothern Medical Association), Dr. G. A. Buchanan (Central Southern Medical Association), Dr. K. S. M. Brown (Central Western Medical Association), Dr. W. T. J. Harris (Eastern Suburbs Medical Association), Dr. A. C. Thomas (Illawarra Suburbs Medical Association), Dr. H. R. Scrivener (Kuring-gai District Medical Association), Dr. R. J. Jackson (Northern District Medical Association), Dr. R. V. Graham (North-Eastern Medical Association), Dr. L. Fetherston (South-Eastern Medical Association), Dr. A. I. Blue (South Sydney Medical

Association), Dr. E. A. Tivey (Warringah District Medical Association), Dr. T. Y. Nelson (Western Suburbs Medical Association), Dr. J. T. Paton (Western Medical Association).

The following members of the Council were present: Dr. George Bell, Dr. J. E. V. Barling, Dr. J. A. Dick, Dr. Hugh Hunter, Dr. W. K. Inglis, Dr. A. J. Gibson, Dr. C. H. E. Lawes, Dr. Kenneth Smith, Dr. E. H. M. Stephen, Dr. W. Vickers, Dr. G. M. Barron, Dr. W. F. Simmons, Dr. A. M. Davidson, Dr. L. A. Dey.

Dr. J. G. Hunter, Medical Secretary of the New South Wales Branch, was present.

Apologies were received from Dr. A. A. Palmer, Dr. C. B. Blackburn and Dr. Mervyn Archdall.

WELCOME OF DELEGATES.

As President of the New South Wales Branch of the British Medical Association, Dr. A. W. Holmes à Court made a brief speech of welcome to the delegates. He remarked that the presence of the delegates, some of whom had come long distances, was greatly appreciated by the Council of the Branch, as this was the only occasion in the year on which the Council had an opportunity of getting into close contact with representatives of Local Associations and obtaining their views at first hand.

RESOLUTIONS PASSED AT PREVIOUS MEETING OF DELEGATES.

Dr. H. R. Scrivener expressed a wish that there should be some discussion on the minutes of the previous annual meeting in regard to the resolutions carried at that meeting. He remarked that the Council apparently had not approved of some of the resolutions. He thought that the delegates should be informed of the Council's reasons.

The Medical Secretary pointed out that every Local Association had been informed of the Council's decisions and that only one resolution had been actually disapproved by the Council, namely, that relating to a proposed alteration to By-Law 9 (*b*). He pointed out also that the by-law could only be altered by the vote of the members of the Branch at a special general meeting. The fact that the particular resolution had been carried by only a very small majority had to some extent influenced the Council in making its decision.

FRIENDLY SOCIETY LODGE PRACTICE.

The Chairman remarked that representatives of the Friendly Societies had approached the Government with the request that some influence should be exerted on the New South Wales Branch of the British Medical Association to obtain conditions more favourable to the Friendly Societies in their relations with members of the Branch engaged in friendly society lodge practice. Accordingly, the Government had arranged a conference between the Council of the Branch and representatives of the Friendly Societies, before the Honorary Minister, who had occupied the chair. Nothing had been decided at the conference; the matters had been left to the Council for consideration. The Friendly Societies expected to learn the results of the deliberations. The matters were of great importance, as they concerned the livelihood of members of the Branch; they could not be dismissed off-hand; the Chairman commended them to the delegates' serious consideration.

The Medical Secretary read a report of the conference between the Council, the representatives of the Friendly Societies and the Honorary Minister.

Proposed Amendments to the Common Form of Agreement Between Medical Officer and Friendly Society Lodge.

The Friendly Societies' Association had advanced several proposals for modification of the Common Form of Agreement. These were discussed individually.

The Extension of the Metropolitan Area.

The first proposal was that the Metropolitan Area, for the purposes of the Common Form of Agreement, should be extended to include the Shires of Sutherland and Blacktown.

It was resolved, on the motion of Dr. A. C. Thomas, Seconded by Dr. T. Y. Nelson:

> That the extension of the Metropolitan Area to Sutherland Area be not acceptable.

In the course of discussion on the motion it was pointed out among other things that the transport facilities in the area were bad and that the Medical Officers had therefore to make many calls. There had been no complaints from the members of lodges in the area.

It was resolved, on the motion of Dr. K. S. M. Brown, seconded by Dr. K. Byrne:

> That the matter of the proposed extension of the Metropolitan Area to the Blacktown Area be left in the hands of the Council.

Dr. K. S. M. Brown remarked that the Central Western Medical Association had come to no decision on the matter because at the time when it should have come up for discussion insufficient members had met to form a quorum. He pointed out that, in a discussion on the advisability of reducing contract fees in the Blacktown area, it was necessary to bear in mind the fact that many Medical Officers were not in the habit of charging for mileage.

Dr. K. Byrne stressed the necessity for charging mileage fees and pointed out that a Medical Officer who did not charge them was breaking his contract.

Dr. W. F. Simmons and Dr. A. M. Davidson took part in the discussion.

City Rates for Newcastle and Other Areas.

The second proposal of the Friendly Societies' Association was that city rates should rule in the City of Newcastle and suburbs of Newcastle and municipalities with a population of 7,500 or over outside the districts of Sydney and suburbs and Newcastle and suburbs.

A full discussion of this difficult problem took place; Dr. Roberts explained to the delegates the peculiar difficulties of practice this area.

It was resolved, on the motion of Dr. J. T. Paton, seconded by Dr. L. Fetherston:

> That city rates be not accepted for contract lodge practice in municipalities outside the district of Sydney and suburbs and Newcastle and suburbs with a population of 7,500 and over.

Dr. J. T. Paton remarked that there were not many lodge members in large towns in the country and that lodge practice was unattractive. By undertaking lodge practice the Medical Officer was granting a favour to the lodges.

Dr. C. H. E. Lawes remarked that the Council had to be provided with some adequate reasons why the proposed charges could not be agreed to. He mentioned in particular that arguments might be based on the matters of expense, density of population and the condition of roads and their bearing on the conduct of practice in any particular locality.

Dr. Kevin Byrne remarked that a Medical Officer was on duty for 168 hours a week, whether there were ten or 1,000 lodge members on his list.

Dr. R. J. Jackson, Dr. G. A. Buchanan, Dr. R. V. Graham, Dr. E. A. Tivey, Dr. A. M. Davidson and Dr. W. F. Simmons also took part in the discussion.

Reduction of Rates.

The third proposal was that rates should be reduced by 22½% and that mileage rates should also be reduced.

It was resolved, on the motion of Dr. L. A. Dey, seconded by Dr. K. S. M. Brown:

> That the request for a reduction of 22½% in rates be not acceded to.

There was a lengthy discussion on the advisability of agreeing to a reduction in mileage rates.

The Medical Secretary pointed out that the rates in Victoria were three shillings and sixpence in the daytime and five shillings at night, in Western Australia two shillings and sixpence and three shillings and sixpence, in South Australia three shillings and sixpence and four shillings and sixpence, in Tasmania two shillings and sixpence and five shillings, and in Queensland five shillings

and seven shillings and sixpence. Dr. A. C. Thomas remarked that in many cases it was difficult to collect fees for fractions of a mile over two miles; most Medical Officers were in the habit of charging five shillings if the distance travelled was three miles; he pointed out that a great many visits were to places two and a half to two and three-quarter miles distant.

Dr. K. S. M. Brown remarked that great difficulties had had to be overcome in the compilation of the Common Form of Agreement, and he strongly opposed any alteration in regard to mileage rates; if the minimum distance was increased, there would be the same trouble in charging for fractions of a mile over three miles as there now was in charging for fractions of a mile over two miles.

Dr. E. Tivey, Dr. G. A. Buchanan, Dr. J. T. Paton, Dr. K. Byrne, Dr. Hugh Hunter, Dr. T. Y. Nelson, Dr. W. T. J. Harris and Dr. H. R. Scrivener also took part in the discussion.

It was resolved, on the motion of Dr. J. T. Paton, seconded by Dr. G. Buchanan:

> That the request for a reduction in mileage rates be not acceded to.

It was proposed, by way of amendment, by Dr. A. I. Blue, seconded by Dr. L. A. Dey:

> That the distance beyond which mileage fees may be charged be increased to three miles.

The amendment was not carried.

Extension of Services.

A further proposal made by the Friendly Societies' Association was that the Medical Officer's services should be extended without additional fee "to include all minor operations and treatment where the doctor does not require the attendance of another medical officer, such as for reducing dislocations, setting fractures, arresting hæmorrhage, suturing accidental wounds, opening superficial abscesses".

The Medical Secretary read the Council's suggested recommendation on the matter:

> That the proposal be not approved in regard to fractures and dislocations but that the Common Form of Agreement be amended to provide that no charge shall be made for minor surgical operations not requiring an anæsthetic, for example, opening boils and abscesses, suturing small wounds.

Dr. T. Y. Nelson moved and Dr. H. R. Scrivener seconded:

> That no extension of the services be granted.

Dr. J. T. Paton remarked that the members of the Western Medical Association agreed to do all the innumerable small things necessary in the surgery without charge; he thought that most Medical Officers, in the country at any rate, made no charge for these small services. Dr. K. S. M. Brown expressed the opinion that a schedule should be drawn up; some Medical Officers charged ten shillings for opening an abscess, others nothing.

Dr. A. C. Thomas doubted the wisdom of drawing up a schedule; there was a danger that the minimum fee would become a maximum for all patients; he believed that many of the minor surgical procedures should be included in the services for which no extra fee was required. The Medical Secretary pointed out that New South Wales was the only State in which charges were made for the services mentioned in the Friendly Societies' Association's proposal; he also remarked that the present system was responsible for a good deal of discontent among lodge members, as there was no uniformity in the fees charged, and very often members were not informed at the time of receiving the services that they would be required to pay. Dr. G. A. Buchanan said that most members of the Central Southern Medical Association thought that it was better to encourage people to seek attention for minor injuries than to discourage them by charging fees in all cases; if people knew they had to pay they might be inclined to neglect attention to minor injuries; most of the members of his Association also thought that the term "minor surgical procedure" was preferable to "operation". Dr. A. M. Davidson remarked that a few Medical Officers had been unreasonable in their charges and this had influenced the lodges in making their request. Dr. K. Byrne, Dr. R. V. Graham, Dr. Kenneth Smith, Dr. W. T. J. Harris and Dr. H. R. Scrivener also took part in the discussion.

It was resolved, by way of amendment, on the motion of Dr. A. C. Thomas:

> That the Council's recommendation be adopted, providing the words "local and general" be inserted before the word "anæsthetic".

Creation of Machinery to deal with Major Disputes between Friendly Societies and Medical Officers.

In discussing the necessity for the creation of machinery for dealing with major disputes between Friendly Societies and Medical Officers, Dr. A. M. Davidson pointed out that if the Friendly Societies had a grievance against any Medical Officer they could approach the Council; it was worthy of note that there had been no major dispute during the previous four years.

It was resolved, on the motion of Dr. A. T. Roberts, seconded by Dr. W. T. J. Harris:

> That the Council's attitude on the matter of creating machinery for dealing with major disputes between Friendly Societies and Medical Officers be endorsed.

(*Note.*—The Council's view was that the existing conditions should continue.)

Deletion of the word "Minimum" where it is used in Relation to Rates.

The sixth suggestion made by the Friendly Societies' Association was that the rates should be regarded as fixed and that the word "minimum" should be deleted.

The Medical Secretary pointed out that rates higher than the minimum were charged in some twelve districts; the Friendly Societies' Association objected to this. The Council's recommendation was that the proposal be not approved.

It was resolved, on the motion of Dr. J. T. Paton, seconded by Dr. T. Y. Nelson:

> That the Council's recommendation be accepted.

The Allowance of Fourteen Days' Grace for the Supplying of Medical Lists.

The Medical Secretary pointed out that the Friendly Societies' Association's request for the allowance of fourteen days' grace for the supplying of medical lists had been acceded to by the Council on January 5, 1933; the matter was being dealt with then in order to provide for it in the amendments to the Common Form of Agreement.

Common Form of Medical Examination Certificate.

The Medical Secretary remarked that the Council had drawn up a form, which, if it met with the approval of the Friendly Societies' Association, would be employed as a common form for the certification of the medical fitness of candidates for membership of lodges. He read out the wording of the form.

It was resolved, on the motion of Dr. K. Byrne, seconded by Dr. J. T. Paton:

> That a common form of medical examination of candidates be adopted, such form to be drawn on the experience of insurance companies, that the fee for examination should be seven shillings and sixpence, and that the Grand Lodge should be responsible for payment.

Dr. A. M. Davidson, Dr. L. Fetherston, Dr. W. F. Simmons and Dr. Hugh Hunter took part in the discussion.

Restriction of Contract System to Registered Friendly Societies.

The last proposal of the Friendly Societies' Association was that the system of contract practice should be restricted to registered friendly societies.

The Medical Secretary pointed out that the Council had recommended that the Friendly Societies' Association be

advised that the association had not the power to restrict contract practice to registered friendly societies.

It was resolved, on the motion of Dr. T. Y. Nelson, seconded by Dr. H. R. Scrivener:

> That the Council's action in the matter of restriction of contract practice to registered friendly societies be approved.

Clauses 11 and 26 of the Common Form of Agreement.

Dr. A. I. Blue moved and Dr. A. T. Roberts seconded:

> That the wives of lodge members, when pregnant, applying for admission to medical benefits, be not admitted until 30 days after their confinements.

Dr. K. Byrne, Dr. J. T. Paton, Dr. A. C. Thomas, Dr. H. R. Scrivener, Dr. L. A. Dey, Dr. Hugh Hunter and the Medical Secretary took part in the discussion.

The motion was not carried.

ADVERTISEMENT IN NEWSPAPERS.

Dr. R. J. Jackson moved and Dr. H. R. Scrivener seconded:

> That this Association views with disapproval the action of the Council in the matter of By-Law 9 (*b*).

Dr. K. Inglis, Dr. A. J. Gibson and the Medical Secretary took part in the discussion.

The motion was not carried.

Dr. R. J. Jackson moved:

> That specialists practising in country towns be allowed to insert one notice in the local press of absence from practice, providing they are away for at least two weeks.

The motion lapsed for want of a seconder.

TARIFF BEDS AT PUBLIC HOSPITALS.

It was resolved, on the motion of Dr. W. T. J. Harris, seconded by Dr. E. A. Tivey:

> That the Council's attention be drawn to the practice of the maintenance of tariff beds at public obstetrical hospitals.

Dr. W. T. J. Harris pointed out that one obstetrical hospital maintained a number of tariff beds, the occupants of which were attended only by the paid staff of the hospital; the members of the Honorary Medical Staff were not allowed to attend them, and fees were collected only by the hospital.

Dr. W. Vickers, Dr. A. M. Davidson, Dr. K. S. M. Brown, Dr. K. Byrne and the Medical Secretary took part in the discussion.

RESOLUTIONS PASSED AT ANNUAL MEETINGS OF DELEGATES.

Dr. K. Byrne moved and Dr. T. Y. Nelson seconded:

> That the motions passed at the Annual Meetings of Delegates should form the basis of the policy of the New South Wales Branch of the British Medical Association in the subjects under discussion. In the event of the Council's disagreement with any decision, the motion, together with the Council's reasons for disapproval, should be referred back to the Local Associations for discussion. If the majority of the Local Associations are still in favour of the motion, as passed at the Annual Meeting of Delegates, the Council should take steps to carry out the wishes of the members of the Association.

Dr. J. T. Paton, in opposing the motion, remarked that delegates had the privilege of voicing their opinions, but did not have to deal with the consequences of any resolutions; the Council had the responsibilities of office.

Dr. A. M. Davidson remarked that the Council made no important change of policy without making every endeavour to obtain the opinions of Local Associations. If the Local Associations did not know about the Council's attitude to the various resolutions passed at annual meetings of delegates, they had only themselves to blame, as they had the privilege of sending representatives to the quarterly meetings of the Council.

Dr. K. S. M. Brown remarked that the existing arrangements could not be bettered. The members of the Council were keen and gave up a great deal of their time to the duties of their office; the less they were irritated the better.

Dr. W. T. J. Harris said that the Eastern Suburbs Medical Association looked on the motion as almost an expression of lack of confidence in the Council.

Dr. Kenneth Smith, Dr. A. C. Thomas, Dr. H. R. Scrivener, Dr. K. Inglis, Dr. R. V. Graham and Dr. F. R. Coyne also took part in the discussion.

The motion was not carried.

FEES FOR LOCUM TENENTES.

Dr. R. J. Jackson moved and Dr. K. S. M. Brown seconded *pro forma*:

> That the fees of *locum tenentes* be reduced in accordance with the reduction in income.

Dr. A. M. Davidson pointed out that there was no scale of fees; the fee for a *locum tenens* was a matter for private arrangement; there must be a great diversity in the fees reasonably payable.

Dr. K. Byrne pointed out that if a medical practitioner wanted a good *locum tenens* he must be prepared to pay adequate fees; it was inadvisable to lower the existing rate.

Dr. J. A. Dick, Dr. A. I. Blue, Dr. L. Fetherston, Dr. F. R. Coyne and Dr. Kenneth Smith also spoke.

The motion was not carried.

WORKERS' COMPENSATION.

Medical Advisers to Insurance Companies.

It was resolved, on the motion of Dr. K. Byrne, seconded by Dr. F. R. Coyne:

> That no member of the British Medical Association shall act for an insurance company in a workers' compensation case in any capacity other than that of medical referee.

Dr. K. Byrne pointed out that the idea behind the motion was that no medical practitioner should work for a company that was boosting his work by advertisements *et cetera*. This was unfair competition.

Dr. F. R. Coyne pointed out that some medical practitioners were working for insurance companies for lower fees than were laid down in Schedule *D* of the Workers' Compensation Act 1926-29.

Dr. A. T. Roberts, Dr. K. S. M. Brown, Dr. G. A. Tivey, Dr. R. V. Graham, Dr. A. M. Davidson and Dr. H. R. Scrivener took part in the discussion.

Medical Fees.

It was resolved, on the motion of Dr. W. T. J. Harris, seconded by Dr. H. R. Scrivener:

> That medical men be paid on a *pro rata* basis in workers' compensation cases in which the medical fees exceed £25.

Dr. W. T. J. Harris pointed out that, under the existing system, a medical practitioner might attend an injured worker for many months, and then receive little or nothing for his services, the fees having been used up in the payment of consultants.

Dr. W. F. Simmons, Dr. G. M. Barron, Dr. A. T. Roberts, Dr. K. Byrne and the Medical Secretary took part in the discussion.

It was resolved, on the motion of Dr. W. T. J. Harris, seconded by Dr. L. Fetherston:

> That the Council of the New South Wales Branch of the British Medical Association be asked to approach the Government to restore discretionary power to the Commissioner to increase medical fees beyond the statutory limit of £25 allowed by the Workers' Compensation Act.

Dr. K. S. M. Brown, Dr. A. T. Roberts, Dr. F. R. Coyne, Dr. K. Byrne, Dr. Kenneth Smith and Dr. G. Bell took part in the discussion.

LUNCHEON.

The Council of the New South Wales Branch of the British Medical Association entertained the delegates at luncheon at the University Club.

Medical Societies.

NORTH COAST MEDICAL ASSOCIATION, QUEENSLAND.

A MEETING OF THE NORTH COAST MEDICAL ASSOCIATION, QUEENSLAND, was held at Gympie on September 30, 1933, DR. L. MORRIS, the Vice-President, in the chair.

Toxæmias of Pregnancy.

DR. JEAN ROUNTREE read a paper on methods adopted at the Rotunda Hospital in the treatment of certain obstetric complications. An interesting point was that the Rotunda Hospital seemed to be swinging to more frequent induction of labour in the treatment of the toxæmias of pregnancy.

Toxic Goitre and Pregnancy.

DR. L. M. OUTRIDGE then demonstrated a case of toxic goitre complicated by pregnancy. Dr. Outridge had decided not to operate during pregnancy, as advocated by Crile, but intended to confine the patient with suitable narcosis, being prepared to give a blood transfusion should labour precipitate a crisis. Then in four to six weeks after confinement he proposed to perform thyreoidectomy.

Fracture of the Radius and Ulna.

DR. A. B. CUNNINGHAM showed a patient with fracture of both bones of the forearm, which had come under his care six weeks after the accident. There was malunion and Dr. Cunningham had performed open operation to obtain a good result.

Gynæcological Conditions.

DR. A. F. KELLY exhibited an interesting specimen of an hydatidiform mole.

DR. T. F. W. POWER gave case reports of *fibromyoma uteri* in an elderly subject, and two cases of central *placenta prævia*, which he had treated by Cæsarean section.

Appendiceal Abscess.

DR. W. L. MILLETT reported a case of late recurring abscess following acute appendicitis. He dealt fully with the differential diagnosis of the condition.

Proctology.

DR. NEVILLE SUTTON, of Brisbane, then read a paper on "Proctology in General Practice". This was well illustrated by lantern slides and was most practical. Dr. Sutton dealt with the treatment of anal fissure and *pruritus ani* by injections of "Proctol"—a solution of anæsthesin in benzyl alcohol. He also described the technique of hæmorrhoidal injection with a solution of carbolic acid and menthol in almond oil. He stressed the importance of correct treatment of peri-anal abscess and dealt with approved techniques of operation for *fistula in ano*.

Election of Office-Bearers.

After the clinical meeting the annual meeting of the Association was held, when the office-bearers, as follows, were elected:

President: Dr. L. Morris.
Vice-President: Dr. F. J. Short.
Honorary Secretary and Treasurer: Dr. H. M. Saxby.

Obituary.

LINDSAY WALKER CRAIG.

DR. LINDSAY WALKER CRAIG, who died on September 15, 1933, after a long illness, was born on November 9, 1893, at Warracknabeal, Victoria. He became a student of medicine at the University of Melbourne, entering Queen's College in 1912. He relinquished his studies during 1913 owing to ill health, but resumed them in 1914 and graduated in medicine in 1918. During his student days he took a prominent part in many student societies and became proficient in many branches of sport. His prowess as a sportsman is described in the appended appreciation from Dr. Gerald Sheahan. After graduation he became a resident medical officer at the Children's Hospital, Carlton. He subsequently practised at Yarran, South Gippsland, for about five years. In 1925 he moved to West Brunswick, where he practised until his final illness overtook him. He built up a sound practice and was known for his kindness and patience as well as his skill. He served for a period as honorary assistant physician to out-patients at the Children's Hospital.

Dr. D. M. Embelton writes:

A wide circle of friends in many walks of life linked to Lindsay Craig through his professional and sporting activities were grieved at his death at the early age of forty years.

Throughout his university career he showed a deftness in golf, billiards and games, fortified by a poise and *sang froid* in difficulty, which made him always a formidable opponent, the winner of several club and open championships, and the trusted representative on the executive of many amateur athletic organizations.

He graduated in medicine in 1918 and after hospital resident appointments he commenced practice in Yarram, Victoria, where he established and maintained till the end of his life many friendships and associations.

In 1926 he commenced practice in Victoria Street, Brunswick, and at the same time established his association with us in the out-patient department of the Children's Hospital, Carlton. Despite the rapid growth of his private practice to almost unmanageable proportions, he actively maintained his hospital association until he could no longer practise. He carried his enthusiasm, optimism and success to the hospital and to private homes, as well as to the athletic field. For his work and personality he was appreciated by us all.

With a young wife and young family dependent upon him, during the long months that he was bedridden he never complained at the inexorable fate in the nature of an irremediable lesion supervening upon just a minor malady to which any of us may be heir. Out of the exquisite physical suffering, anxiety and disappointment he bestowed upon us a rare exhibition of sustained moral courage, courtesy and fortitude. With his wife we deeply sympathize, but feel sure it will sustain her courage and mollify her grief to know he has left a memory so fragrant in the path that he has trod.

Dr. J. Gerald Sheahan writes:

I met Dr. Lindsay Craig for the first time in 1926, on his coming to practise at Brunswick, and was at once attracted by his virility, force and magnetic personality. Later we worked together, and I knew him to be a surgeon of sound judgement and manual dexterity, and his operative methods were sure and steady, and he never attempted anything that he thought another surgeon could do better. He was equally at home in general medicine and children's diseases.

He was a man of action, with a fearless and buoyant mind and of flawless integrity; he inspired confidence and affection in his patients, whilst his generosity knew no bounds.

He was probably one of the best all-round athletes Australia has produced.

Entering the Melbourne University, Craig starred at football, cricket and tennis, and in a pennant match once

beat the redoubtable Brookes, and, showing his versatility, he won easily a country championship, playing left-handed after injuring his right hand. As a boxer he won the welterweight title, fighting out of his class; and was a wrestler of repute. He won the country golf championship for the first two years of its establishment, and qualified for State and national titles and reached the semi-final in the amateur championship. The touch for the billiard ball was just as acute, for he was a first-class player and won several championships and competed for the State title. He was good with the gun and rod.

In Brunswick he was wicket-keeper of the 1929 pennant team and a keen bowler, and the members of the bowling club lined the roadway whilst the cortege of forty-six cars passed the green.

The City Council, on behalf of the citizens of Brunswick, forwarded a message of condolence and said Dr. Craig's sporting successes paled into insignificance compared with his citizenship.

Withal, Lindsay Craig was very modest about his attainments; yet he was quick and generous to recognize ability in others, and his loyalty and sincerity made him the best of friends. He played the game up to the hilt, and his very versatility, combined with the capacity for hard work in the service of his fellow men, caused him to make too great an inroad on his rugged constitution.

His early death leaves an aching void in the hearts of all who knew him, but to me, whose privilege it was to be his pal, he leaves behind an unforgettable and intangible fragrant memory, which makes me feel how fortunate I was that he passed my way.

ROBERT DILLON LEMON.

DR. ROBERT DILLON LEMON, whose death was recently reported in these pages, was born at Hawthorn, Victoria, on January 18, 1886. His education was begun at the Brighton State School. Here he won a scholarship that took him to the Melbourne Church of England Grammar School in 1901. He matriculated in 1903 and in the following year became a student of medicine at the University of Melbourne. He graduated as Bachelor of Medicine and Bachelor of Surgery in 1910. He was appointed Resident Medical Officer at the Ballarat Hospital soon after graduation and remained there till 1913 when he left for England for post-graduate study.

On the outbreak of war he offered his services to the military authorities in England and was placed in charge of Saint Andrew's Hospital, Dallis Hill, near London. Having been unsuccessful in his attempt to join the Australian Army Medical Corps, he joined the Royal Army Medical Corps in November, 1915. His first unit was the 106th Field Ambulance. He worked in advanced dressing stations during the fighting on the Somme in July and August, 1916, and was promoted to the rank of Captain in November of that year. In April, 1918, he was mentioned in dispatches "for gallant and soldierly conduct when in charge of an advanced dressing station". He was slightly gassed on this occasion. He was demobilized in November, 1918. At the beginning of 1919 he joined the medical staff of the Caulfield Military Hospital where he remained till 1930, when he was transferred to the Department of Repatriation on St. Kilda Road. He died after a long illness, being bedridden for eighteen months, and he bore his sufferings with most wonderful patience and fortitude.

FREDERICK WILLIAM HALL.

WE regret to announce the death of Dr. Frederick William Hall, which occurred on November 25, 1933, at Vaucluse, New South Wales.

Correspondence.

CHRONIC NEPHRITIS.

SIR: I have read with interest Dr. L. J. Jarvis Nye's letter of October 28.

My article of September 16 was written not to excite controversy, but to be informative, and for a much wider audience than your Queensland readers.

It was thought, however, that the lead theory of the ætiology of nephritis, as taught by some Queensland practitioners, was worthy of mention. Personally, I do not accept dogma, no matter how often reiterated, and my experience of nephritis has not encouraged me to accept *in toto* the lead hypothesis.

The only case of so-called lead nephritis I have seen demonstrated was so unconvincing that I could not understand why it was shown.

The whole point to my mind is whether these cases of "plumbism" are really lead poisoning, and whether the lead poisoning *per se* causes the nephritis. This has not been proved, and the evidence adduced is largely circumstantial.

It has to be borne in mind that young practitioners in this State, so to speak, are brought up on "plumbism", and every anæmia, every basophilia, every paralysis, every headache, and every stomach ache is possibly labelled "plumbism"; and the statistics are very liable to be misleading, so that it is more than likely that the figures quoted by Dr. Nye are based on faulty diagnoses.

I entirely agree with Dr. Nye that it will be a good thing if the matter is scientifically investigated by a competent research man, but he will require more than a few statistics to convince myself and others on a subject that is difficult in the extreme, and that may be still regarded as virgin soil.

Yours, etc.,

EUSTACE RUSSELL.

Ballow Chambers,
Wickham Terrace,
Brisbane,
November 16, 1933.

DIAGNOSTIC SWABBINGS IN DIPHTHERIA.

SIR: The subject raised by the letters of Dr. R. Millard and Dr. L. E. Hurley is of such importance that I feel that no apology is needed for bringing under notice the results of my experience in the matter.

I agree that to rely on the result of swab examination to the extent of withholding antitoxin from a really sick patient or from one whose condition is strongly suspicious of diphtheria, because of a negative report, or even under such circumstances to await the result of a report, is to subject the patient to an unwarranted and unnecessary risk and is inexcusable.

However, provided swabs are properly taken and adequately examined by a competent bacteriologist, the results obtainable are frequently of great advantage when clinical judgement is exercised in their application in treatment. Unfortunately there has been far too much slipshod bacteriological work, but the taking of a swab has not always been given the necessary care.

In a paper presented to the Australasian Medical Congress (British Medical Association) in 1923 by Dr. Burnell and myself, we gave our opinion that examination of diphtheria swabs should either be carried out with great care or not at all, but preferably the former, and my results from examination of direct smears were discussed.

In regard to the latter, the advantages indicated were:

1. Rapid confirmation of clinical opinion where antitoxin had already been given.

2. Diagnostic assistance in cases where the clinical conditions do not demand immediate antitoxin treatment, for example, cases which appear to be tonsillitis or non-diphtheritic pharyngitis, but in which it is safer to have a bacteriological examination.

3. Not infrequently cases of Vincent's angina would be wrongly diagnosed apart from the examination of direct smears, and undoubtedly where such examination is omitted some unexpected negative results in culturing for diphtheria bacilli are thus accounted for.

Admittedly direct smear examinations require considerable experience as well as care and patience, but the results are well worth the trouble involved, and I have now for years very rarely indeed had a positive result from a culture where the direct smear examination was negative.

There is no doubt, therefore, that properly taken and examined swabs are of considerable value in the treatment of diphtheria, provided their limitations are realized.

Yours, etc.,

D. L. BARLOW.

North Terrace,
Adelaide.
(Undated.)

HOSPITAL PRACTICE.

SIR: For some time past the conditions surrounding the practice of a specialty have been steadily changing for the worse. By a specialty practice I refer chiefly to eye, ear, nose and throat, skin, venereal diseases, X ray and pathology. At a time when the whole workings of medical and hospital practice are in the melting pot, such as the introduction of paying and intermediate beds in public hospitals, and the invasion of State clinics into the realm of practice, sometimes with inadequate or no supervision as to the suitability of persons applying for treatment, it seems fair to ask how far the special clinics at the public hospitals can continue to be run wholly with recompense. For some time this fact has been appreciated in regard to pathological and radiological work, and many "honoraries" in these branches are paid something for their work. It seems very patent that this is a distinction without a difference, and it might be wise for members of these specialties to bring this subject up in their various societies, either separately or collectively, so that their views might be adequately represented in the deliberations of the councils. It is safe to say that in some of the above specialties almost all of the patients treated at public hospitals are out-patient cases, and the specialist will not appreciably benefit by the scheme for private beds.

The old time antipathy to being treated at public hospitals has disappeared and the special departments are often used "in consultation" by the general practitioner. The improved organization and excellent attention now accorded patients in public hospitals often determine a person to seek treatment there for preference. It is sometimes argued that the specialties are overcrowded. It may be as far as private work goes, but not so in the case of public work. This is accentuated by the fact that most small outlying district hospitals now find it necessary to have a full complement of specialists on their staff. Very few specialists have less than two hospital appointments, and many have more.

I understand that many aspects of this question are at present receiving the attention of members of other branches of the profession, and it would be in the interests of the members of the above specialties if they did not delay in voicing their opinions.

Yours, etc.,

"POLICY."

Undated.

Medical Prizes.

THE ALVARENGA PRIZE.

THE College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1934, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

An essay intended for competition may be upon any subject in medicine, but must be accompanied by a written assurance from the author that it has not appeared previously in print, either in whole or in part, in any form, and has not been presented elsewhere in competition for a prize. The essay should represent an addition to the knowledge and understanding of the subject based upon either original or literary research. It must be typewritten, and in English acceptable for publication without necessity for editing by the Committee. Any illustrations should be appropriate and correctly annotated with the text. Essays must be received by the Secretary of the College on or before May 1, 1934.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; and that it may be published by the author with the consent of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1933 has been awarded to Dr. Harry Shay and Dr. J. Gershon Cohen, of Philadelphia, for their essay entitled "Experimental Studies in Gastric Physiology in Man".

Proceedings of the Australian Medical Boards.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners.

Smithers, Warwick McLean, M.B., B.S., 1933 (Univ. Melbourne), Public Hospital, Launceston.

Drury, Harrie Denison, M.B., B.S., 1933 (Univ. Melbourne), 3, Greenlands Avenue, Sandy Bay.

McIntosh, Ronald Dingwall, B.A., 1912 (Univ. Melbourne), M.B., B.S., 1921 (Univ. Melbourne), 180, Macquarie Street, Hobart.

Corrigendum.

Two errors have appeared in the paper by Dr. Archie Aspinall on intestinal obstruction following operations on the lower part of the abdomen, appearing in the issue of November 25, 1933. On page 713, under the causes of mechanical ileus, the last cause should read: "(*f*) narrowing of the bowels." On page 714, in the first column, reference is made to an enema of milk and molasses. The words "do not beat the milk" should be "do not heat the milk".

Books Received.

THE OCCIPITO-POSTERIOR POSITION: ITS MECHANISM AND TREATMENT, WITH A NEW CONCEPTION OF THE ROLE OF THE PELVIC FLOOR, by Roland Beard, M.C., M.B., B.S., F.R.C.S., F.R.A.C.S.; 1933. Adelaide: F. W. Preece and Sons. Demy 8vo., pp. 36, with illustrations.

PRACTICAL POINTS IN EYE SURGERY AND DRESSING FOR NURSES, HOUSE SURGEONS AND GENERAL PRACTITIONERS, by H. E. Jones, M.R.C.S., L.R.C.P.; 1933. London: John Bale, Sons and Danielsson, Limited. Crown 8vo., pp. 27.

HISTORY OF THE UNIVERSITY OF EDINBURGH, 1883-1933, edited on behalf of the History Committee by A. L. Turner, M.D., LL.D., F.R.C.S.; 1933. Edinburgh: Oliver and Boyd. Royal 8vo., pp. 483. Price: 10s. net.

PYE'S ELEMENTARY BANDAGING AND SURGICAL DRESSING, WITH DIRECTIONS CONCERNING THE IMMEDIATE TREATMENT OF CASES OF EMERGENCY FOR THE USE OF DRESSERS AND NURSES, revised from H. W. Carson's Tenth Edition of Pye's Surgical Handicraft by A. J. Cokkinis, M.B., F.R.C.S.; Fifteenth Edition; 1933. Bristol: John Wright and Sons, Limited. Demy 18mo., pp. 243, with illustrations. Price: 3s. 6d. net.

SEX LIFE AND SEX ETHICS, by R. Guyon, translated by J. C. and I. Flugel, with an introduction and notes by N. Haire, Ch.M., M.B.; 1933. London: John Lane the Bodley Head Limited. Demy 8vo., pp. 408. Price 15s. net.

AN OUTLINE OF IMMUNITY, by W. W. C. Topley, M.A., M.D., F.R.C.P., F.R.S.; 1933. London: Edward Arnold and Company. Super royal 8vo., pp. 502, with illustrations. Price: 18s. net.

DIPHTHERIA IMMUNIZATION: PROPAGANDA AND COUNTER-PROPAGANDA, compiled by J. G. Wilson, M.D., M.R.C.P., D.P.H., with preface by J. G. Forbes, M.D., F.R.C.P., D.P.H.; 1933. Dewsbury: Joseph Ward and Company. Demy 8vo., pp. 117. Price: 2s. 6d. net.

Diary for the Month.

DEC. 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.
DEC. 5.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
DEC. 6.—Western Australian Branch, B.M.A.: Council.
DEC. 6.—Victorian Branch, B.M.A.: Annual Meeting.
DEC. 7.—South Australian Branch, B.M.A.: Council.
DEC. 8.—Queensland Branch, B.M.A.: Branch (Annual).
DEC. 12.—New South Wales Branch, B.M.A.: Ethics Committee.
DEC. 14.—Victorian Branch, B.M.A.: Council.
DEC. 14.—New South Wales Branch, B.M.A.: Branch.
DEC. 15.—Queensland Branch, B.M.A.: Council.
DEC. 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.

Medical Appointments.

Dr. J. S. A. Rogers (B.M.A.) has been appointed Superintendent of the Hospital for the Insane, Beechworth, Victoria, pursuant to the provisions of the *Lunacy Act*, 1928.

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Dr. N. J. Symington (B.M.A.) has been temporarily appointed Senior Medical Officer, Office of the Director-General of Public Health, New South Wales.

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Dr. F. H. H. Wilson (B.M.A.) has been temporarily appointed Senior Medical Officer, Office of the Director-General of Public Health, New South Wales.

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Dr. A. J. Kelsey (B.M.A.) has been appointed to act at the Port of Bowen, Queensland, as Medical Inspector of Seamen for the purposes of the *Navigation Act*, 1912-1926.

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Dr. J. S. MacFarlane has been appointed Government Medical Officer at Greta, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xvi and xvii

AUSTIN HOSPITAL FOR CANCER AND CHRONIC DISEASES, HEIDELBERG, VICTORIA: Resident Medical Superintendent.
DEVON PUBLIC HOSPITAL, LATROBE, TASMANIA: House Surgeon.
HOBART PUBLIC HOSPITAL, HOBART, TASMANIA: Junior Resident Medical Officers.
NEW SOUTH WALES MASONIC HOSPITAL, ASHFIELD, NEW SOUTH WALES: Resident Medical Officer.
PARRAMATTA DISTRICT HOSPITAL, PARRAMATTA, NEW SOUTH WALES: Junior Resident Medical Officer.
PUBLIC SERVICE COMMISSIONER, ADELAIDE, SOUTH AUSTRALIA: Medical Officers.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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